TAMING THE WILDINGS

HERBERT DURAND

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A New England Aster on the Bank
Aster novæ-angliæ

Taming the Wildings

A Book of Cultural Information for Lovers of Our Wild Flowers, Wild Bushes, and Ferns, Who Desire to Grow Them for Landscape and Garden Effects, or for Planting in Congenial and Sheltered Retreats Where They Can Be Protected from Their Foes

By Herbert Durand

With a Foreword by
Dr. Edgar T. Wherry
President, Washington, D. C., Chapter, Wild Flower Preservation Society of America

Illustrated with 23 Colored Plates and 140 other Illustrations, all from photographs taken in the wild and showing the plants as they grow in their natural haunts

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To

MY WIFE

WITH FOND MEMORIES OF THE MANY PERFECT DAYS
WHEN WE TOGETHER ALL THE PLEASURES PROVED

"That hill and valley, swamp and field,
Woods and sleepy mountain yield."

FOREWORD

By Dr. Edgar T. Wherry, *President of the Washington, D. C., Chapter of the Wild Flower Preservation Society of America.*

One of the best methods of protecting and preserving our native plants is to bring them into cultivation. They can then be more effectually protected from vandals, from natural enemies, and from competition with one another; and, ripening their seeds in safe retreats, they will continually spread out into neighboring regions where the natural vegetation has been diminished or destroyed, and will reëstablish themselves there. Successful wild flower gardening, however, requires the application of different methods from those used in ordinary gardening, and the published information on the subject is very limited in amount.

It would be difficult to find anyone better fitted to write a book about gardening with native plants than Mr. Herbert Durand. For he has a deep love for Nature, which has led him to devote his spare time for a

great many years to the study and experimental cultivation of the wild bushes, wild flowers and ferns. He also possesses artistic sense and technical skill which make him one of our most successful naturalistic landscape architects; and he presents the knowledge he has acquired in readily understandable and attractive form. It is, perhaps, open to question whether his retention in some instances of the scientific nomenclature of a past generation is altogether desirable, but possibly, under the circumstances, this cannot be avoided. And, of course, the common names of the plants enable the student of present-day botany to recognize the species meant. In the other data given the book is thoroughly up to date.

No one should undertake the cultivation of the rarer wild flowers unless he is ready to supply their simple but imperative needs; for otherwise his experiments are likely to result in wild flower destruction rather than protection. But now that Mr. Durand's book is available the achievement of success along this line is made more certain. The writer of this foreword has under cultivation in a small garden nearly all the species here included, as well as many others which may perhaps be considered at some future time; and what Mr. Durand says on the subject

is in every respect in accord with his experience. The book can therefore be warmly recommended to every one who is so fortunate as to have an opportunity to engage actively in the fascinating and very necessary work of preserving, protecting and increasing the wild flowers by the application of approved cultural methods.

EXPLANATORY AND APPRECIATIVE

My valued friend and counselor, Dr. Wherry, in his foreword to this volume, is inclined to question the retention of certain botanical names which he evidently thinks are or should be obsolete. I do not venture to dispute so learned and eminent an authority and can only say in explanation that I find myself compelled to adopt the nomenclature of the latest edition (1912) of the Mathews Field Books, for very excellent reasons.

This is, so far as I know, the first book ever written, devoted exclusively to the *culture* of our native plants.

It is obviously necessary that it be rather closely linked with some authoritative, popular and handy work which, by faithful illustration and terse, non-technical description, makes it easy for the novice to identify different plant species in the wild.

The *Field Book of American Trees and Shrubs* and the *Field Book of American Wild Flowers*, both written by Mr. F. Schuyler

Mathews and illustrated by his facile pen, meet the requirements mentioned in every respect. No other wild flower book that I have seen can equal them in this regard.

It was decided therefore that *Taming the Wildings* should be made a companion book to the Mathews books—a cultural sequel, so to speak. Of course this decision necessarily determined what system of nomenclature should be adopted; and the names according to Mathews, are the result.

These names, to quote from Mr. Mathews' remarks on the subject in the latest revised edition of his *Field Book of American Wild Flowers*, "are now those of the seventh edition of Gray's *Manual of Botany*, and in accordance with the code of the International Congress of Botanists held in Vienna, June, 1905. It is also a satisfaction to note that in many instances they accord with those of Britton and Brown's *Flora of the United States and Canada*."

So, until Gray's *Manual* and Mathews shall in future editions make further name changes, the student of present-day botany who chances to read these pages, must perforce put up with the author's old fogyism and worry along the best he can with the common names; about which I may say, in passing, there seems to be quite as much

confusion and doubt as there is about their botanical synonyms.

The illustrations in this book are what is known as "habitat pictures"; that is, they are reproductions of photographs taken in the woods and fields and show the different plants growing in their natural environments. The colored plates are from similar photographs. Taken in connection with Mr. Mathews' admirable pen drawings of individual flowers and foliage, they give a very clear idea of the characteristics of the plants and flowers depicted, together with the natural conditions and surroundings to which they are accustomed. These should be duplicated as closely as possible in new locations in order to insure cultural success.

For the most of the photographs, I am indebted to the courtesy of Dr. Wherry and his associates of the Washington Wild Flower Preservation Society and the United States Department of Agriculture. The name of the gentleman who "took the picture" is printed under each cut so obtained.

I also wish to here acknowledge, with sincere appreciation, the friendly coöperation and valuable advice of the following admirers and students of our wonderful American flora:

Dr. Edgar T. Wherry, for the "meat" of

the extremely important chapter on soils and for the surprising amount of information regarding the cultural requirements of many plants, gained from his own personal experiences and tests.

Mrs. Elizabeth Gurney Britton, Honorary Curator of the New York Botanical Garden.

Dr. R. C. Benedict, of the Brooklyn Botanic Garden.

Mrs. Oakleigh Thorne, Millbrook, N. Y.

Mr. Anton G. Hodenpyl, Locust Valley, L. I., N. Y.

Mrs. Louise Beebe Wilder, Bronxville, N. Y.

I am also under deep obligations to Professor Willard N. Clute, for information culled from his invaluable book *Our Ferns in their Haunts;* to Mrs. Harriet L. Keeler's *Our Northern Shrubs*, for several interesting and informative quotations, and to Mr. F. Schuyler Mathews, whose two Field Books have been shamelessly copied as regards size, arrangement and general make-up, and are repeatedly referred to and quoted in these pages.

That errors of various kinds and degrees can be found throughout the book is to be expected. I can only implore their discoverers to be charitable and remember that the

subject of wild plant culture is comparatively new and that most of us would-be gardeners with native plants are still in the primer class.

H. D.

Bronxville, N. Y.
April, 1923.

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TAMING THE WILDINGS

"There lies before me a long, brown path
Leading wherever I please."—WHITMAN

"He is happiest who hath power
To gather wisdom from a flower,
And wake his heart in every hour
To pleasant gratitude."

—WORDSWORTH.

CHAPTER I

Wild Gardening Defined

The term wild gardening, as it is employed in the text of this book, means any kind of gardening involving the use of plants that are native to this country.

It comprises the selection of suitable species for different purposes, their harmonious arrangement, necessary preparation of the soil, planting of the material, its cultural care and all other operations necessary to its protection, vigorous growth and permanent welfare.

Wild gardening is essentially naturalistic and informal in character and has nothing to do with either foreign or formal styles of landscape gardening. It is as much out of place in the conventional flower garden, as it would be in the vegetable garden. It therefore affords little opportunity for the use of any but indigenous plants.

Wild gardening, as thus defined, may be practised for the following purposes:

1. For the landscape treatment of large

properties such as public parks and extensive private estates.

2. For restoring the original charm of neglected woodlands and developing the latent beauty of any forested area.

3. For boundary plantings and shrubbery groups on average home grounds, or on grounds that pertain to or are in the immediate vicinity of the house.

4. For the screening of unsightly objects and the shutting out of undesirable views.

5. For converting rough, barren and infertile localities into attractive features of the place by covering them with flowering or foliage plants and vines.

6. For the establishing of wild flower sanctuaries and bird sanctuaries.

7. For the tasteful planting of rock gardens, wild flower gardens, fern gardens, bog gardens and water gardens.

There are certain fundamental principles which should govern and direct the practice of wild or natural gardening.

The trees and shrubs used in the composition of landscape pictures should be confined almost exclusively to kinds that grow naturally in the vicinity. This is obviously essential to that pleasing harmony with the surrounding scenery which regard for the dictates of good taste demands.

The same rule should apply in the selection of material for any naturalistic planting, regardless of its size, situation or purpose.

The introduction of plants of foreign origin into natural plantings and wild gardens is permissible only for purposes of embellishment. They should never be allowed to dominate and must harmonize, as regards form, foliage, color of bloom and general aspect, with the native plants around them. Bizarre and incongruous specimens should be rigidly excluded.

The trees and shrubs in natural plantings should be so selected and arranged that a satisfying variety of spring and summer bloom and foliage will be followed by an equally pleasing display of autumn color.

The cultural requirements of native plants selected for naturalistic work should be ascertained and complied with, particularly as regards the character and treatment of the soil.

The natural features of the place—such as the contours of the ground, the distant outlooks, the sky lines, desirable indigenous trees and shrubs—should be scrupulously preserved, so that by embellishing them and by guiding and encouraging Nature in their development, a series of delightful pictures will be created that are faithfully expressive

of that simplicity, refinement and endless variety of form and color which characterize our American scenery.

Special stress is laid upon careful adherence to these basic principles of landscape art, because they have been ignored to such an extent in this country that over seventy-five per cent of the planting material used today in American landscape work is of foreign origin. This is the more surprising when we consider that the American flora is so widely diversified, so wonderfully rich in beautiful and useful trees, shrubs, herbaceous flowering plants and ferns, that there are suitable species in abundance for every imaginable situation and purpose.

It is a common but mistaken impression that wild plants are inherently scraggly and unattractive in form. The fact is that if they are relieved of the intense competition that prevails in the wild and given room to develop in a congenial location, they quickly make luxurious growth, become compact and shapely and produce larger and better flowers in greater profusion.

There is another wide-spread but erroneous notion that the cultivation of wild plants is a complicated process which usually results in failure. On the contrary, it is a very simple undertaking, particularly when

compared with ordinary gardening. The main thing is to provide the plants with comfortable quarters, in which the conditions of soil, exposure, moisture and environment shall duplicate those of their natural haunts as closely as possible. This done, the only after care necessary to insure vigorous growth, bountiful bloom and normal reproduction is to keep out undesirable intruders (weeds and vandals) and to prevent overcrowding by an occasional judicious thinning out of the plants. Plows and harrows, hoes and rakes, pruning shears and stakes, manures and spray pumps have no place in wild gardens, whether they be man-made or of Nature's own contriving and planting. In fact the only accessories in the way of tools I have found necessary are grub hoes, stout trowels and light short-handled spades, such as were used by our soldiers in the Great War for digging trenches, and which can be obtained at any "Army and Navy Store."

CHAPTER II

Natural Soils and their Treatment

A knowledge of the character of the soil and how to treat it is the most important factor in the growing and care of wild plants. In fact, many native species are so fastidious in this regard, that if planted in soil that is not to their liking, they literally go on hunger strikes and soon perish of malnutrition.

To clearly understand the soil preferences of different forms of vegetation, it is necessary to keep in mind the arrangement and characteristics of the soil strata. In the states east of the Mississippi River, it is usually an easy matter to trace natural soil gradations. Throughout this region, as a rule, immediately under the surface, or topsoil, is a layer of subsoil, and then either a layer of hardpan, or the underlying solid rock. Topsoil, which varies greatly in depth, is called rich if it is composed largely of partially decayed vegetable matter or humus. Such soil is dark in color and loose or friable.

If the decomposition has been thorough, or if the soil is affected by the admixture or proximity of limestone, the reaction may be neutral or alkaline. But if only partial decay has occurred, it is likely to show an acid reaction, sometimes slight, sometimes of considerable intensity.

Subsoil differs from topsoil in containing a smaller percentage of humus and in being more compact because of the accumulation of fine particles of decomposed rock or carbonate minerals carried down by percolating rain water.

Hardpan contains no humus and is much denser than subsoil, frequently having an almost rock-like consistency.

It has been demonstrated by experimenters of the United States Department of Agriculture that the chemical reactions of soils are very important factors in the successful culture of many of our most attractive wild plants. Dr. Edgar T. Wherry, of the Bureau of Plant Industry, in an article entitled *Cultivating Wild Flowers*, says: "While our most vigorous wild flowers are relatively indifferent to the chemical character of the soil and will grow almost anywhere, the delicate ones that are most admired for their beauty (and are most likely to be exterminated by careless picking) are extremely sensitive in

this regard. Some grow best in soils that are acid, some in soils that are alkaline (the opposite of acid) and still others in neutral soils (neither acid or alkaline). Before such plants can be successfully grown in cultivation, it is necessary to ascertain their soil preferences and to adjust the acidity of the new location accordingly."

It is well to note, particularly in view of what follows, that soil acidity is a characteristic of humus; and as humus exists in largest measure in topsoil, diminishing with depth, so acidity decreases. In other words, under an intensely acid topsoil, may lie a neutral or even alkaline subsoil and hardpan.

Dr. Wherry has greatly simplified the consideration of wild soils by classifying them under four groups. These groups, as far as wild gardening is concerned, are formed with regard to the degree of acidity or alkalinity present in each and have no relation to other cultural needs, such as texture, moisture, temperature and exposure, which are better known and understood yet, on the whole, are less important. The basis for the tests which determine this classification is pure water, which nevertheless contains a minute quantity of both acid and alkali, the one balancing the other, so the water is said to be neutral.

Soils which contain less than ten times as much active acid or active alkali, as is found in pure water, are classed as *circumneutral*, or nearly neutral soils. Ordinary garden loam belongs in this class.

(As none of the plants considered in this book prefer soil that contains a greater percentage of lime than ten, the classification *alkaline*, is omitted.)

Soils containing 10 to 100 times as much acid as pure water are classed as *sub-acid*, or moderately acid. Dark-colored woods earth, except that found under oaks or coniferous evergreens, is an example of sub-acid soil.

Soils containing more than 100 times as much acid as pure water are classed as *mediacid*, or intensely acid, and the degree of acidity may run as high as 1000, although 300 is the usual extreme. Humus that is rich in tannic acid, like that usually found under hemlocks and oaks, belongs in the mediacid class.

The largest number of species of shrubs, herbaceous wild flowers and ferns are found and will thrive in circumneutral soils.

Another group, almost as numerous, is relatively indifferent as regards soils, and its members flourish equally well in any.

Finally there are many exceedingly beautiful flowering plants and ferns, some of them

very rare, which can be successfully grown only in mediacid soils. Among these are the rhododendrons, azaleas, mountain laurel, blueberries and other shrubs of the Heath family, and such herbaceous plants as the trailing arbutus, the pink moccasin flower, the twin flower and the painted trillium.

Mediacid soils are made up in great part of partially decomposed leaves, twigs and bark dropped from hemlocks, pines, oaks and other trees and shrubs whose foliage is rich in tannic acid. This has led to the discovery that subacid or even circumneutral soils may have their acidity increased by adding mediacid soil and covering with a mediacid mulch; or, if these are not obtainable, by watering with a solution of commercial tannic acid (about one part acid to fifty parts water), and mulching with whatever material is available, provided it is not alkaline. In soil thus treated, if other obvious requirements as to texture, moisture, exposure and absence of limestone rocks are complied with, any of the plants classified as requiring mediacid soil may be grown with entire success.

Before planting a locality treated with tannic acid, a period of at least two weeks should be allowed for the acid to become thoroughly assimilated.

Mr. F. V. Coville, Chief Botanist of the United States Department of Agriculture, has obtained very encouraging results from the use of aluminum sulphate as a means of increasing soil acidity. His experiments with *Rhododendron maximum* in soil treated with this chemical have shown that it induces a surprisingly vigorous growth. At this writing, however (Spring 1923), it remains to be seen whether the new treatment is permanently better for acid soil plants than that with tannic acid. Mr. Coville's method of applying aluminum sulphate is to sprinkle it evenly over the surface of the ground—about one half pound to the square yard.

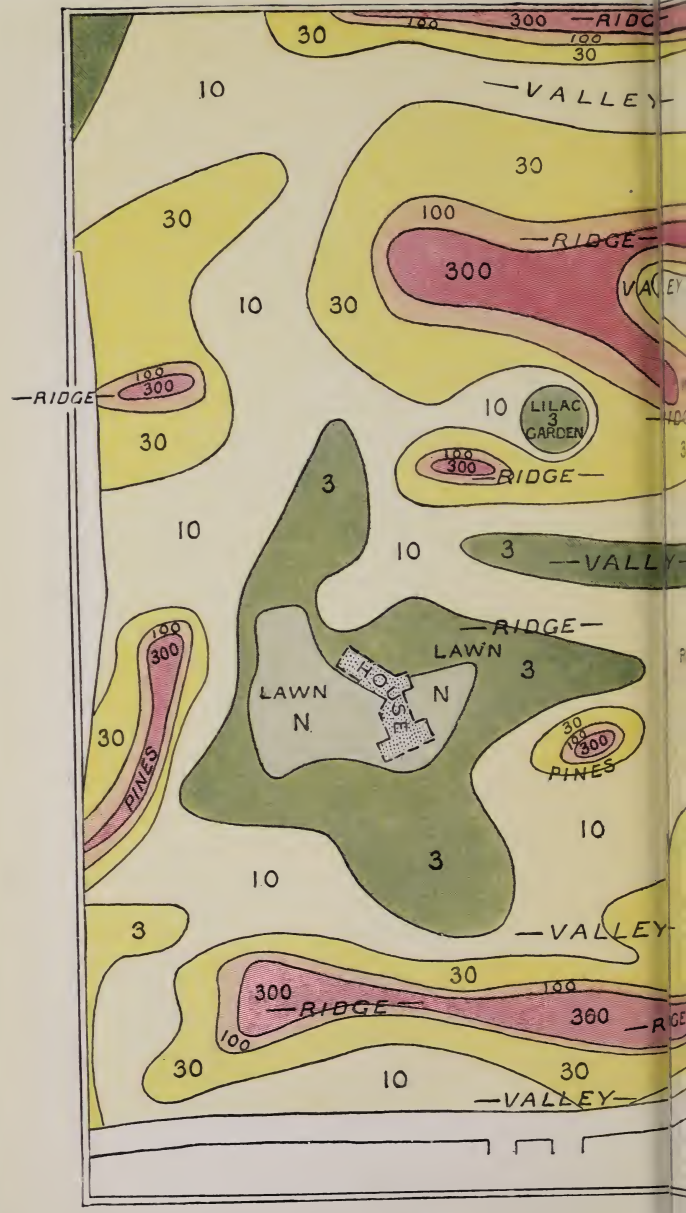
No one should attempt to establish *extensive* colonies of the rarer wild bushes and flowers without first having the soil tested in all localities in which such planting is contemplated, for soils often vary widely in acidity within a few feet. To determine the actual proportion of acid or alkali present, it is necessary to dissolve a sample of the soil in pure water and then to test this solution with indicators, or dyes which change their colors according to the intensity of either. The indicators used by Dr. Wherry are put up by the La Motte Chemical Products Company of Baltimore and are

obtainable of wholesale chemists in other cities.

On large estates it is advantageous to engage some competent person to prepare soil acidity maps showing by color patterns just what kind of soil is present in the different areas under cultural consideration. This is, of course, a matter of real importance to those who desire to establish large plantings of rhododendrons, mountain laurel, azaleas and other shrubs of the Heather family. These plants are all expensive and, aside from their esthetic value when harmoniously grouped in the landscape, no one cares to invest considerable amounts of money in planting material, however beautiful, unless there is a reasonable certainty that it will live and prosper in the locality in which it is placed.

Dr. Wherry has given me permission to incorporate in this book a color plate reproduction of a soil map drawn in accordance with soil tests made recently by him on the estate of Mr. Anton G. Hodenpyl, at Locust Valley, N. Y. The following is an abstract of portions of an article written by him for the journal *Ecology* detailing the results of these tests:

On the Hodenpyl place is a series of irregular ridges having a maximum elevation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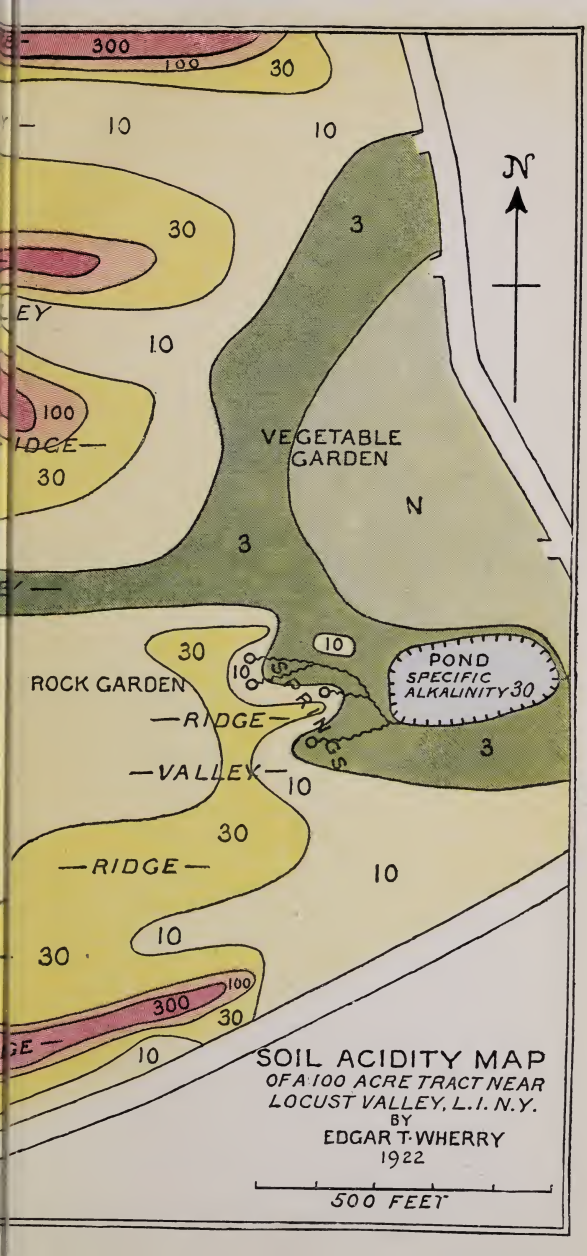
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SOIL ACIDITY MAP
OF A 100 ACRE TRACT NEAR
LOCUST VALLEY, L. I. N. Y.
BY
EDGAR T. WHERRY
1922
500 FEET

of about fifty feet. The highest acidity was found to exist in the soils of the ridge summits with a definite decrease down the slopes that is more rapid on the southern sides than on the northern. This agrees with Dr. Wherry's experiences in the northeastern states, that northern slopes tend to be more acid than southern. In the valley bottoms, the acidity diminishes to as low as three.

The native vegetation reflects clearly the difference in degree of acidity between ridges and valleys. For instance, ten characteristic plants in the strongly acid summit soils are:

Canada Mayflower (*Maianthemum canadense*)
Star Grass (*Hypoxis hirsuta*)
Wood Anemone (*Anemone quinquefolia*)
Frostweed (*Helianthemum canadense*)
Pinxter Flower (*Rhododendron nudiflorum*)
Black Huckleberry (*Gaylussacia baccata*)
Late Blueberry (*Vaccinium vacillans*)
Four-leaved Loosestrife (*Lysimachia quadrifolia*)
Cow-wheat (*Melampyrum lineare*)
Dockmackie (*Viburnum acerifolium*)

While most of these plants are more or less frequent all over the place, locations in which they are notably abundant and dominant always show the higher degree of acidity.

Ten characteristic plants of the minim-acid or circumneutral soils in the valleys are:

Lady Fern (*Asplenium filix-fœmina*)
Jack-in-the-Pulpit (*Arisæma triphyllum*)
Bloodroot (*Sanguinaria canadensis*)
Wild Geranium (*Geranium maculatum*)
Poison Ivy (*Rhus toxicodendron*)
Enchanter's Nightshade (*Circœa lutetiana*)
Figwort (*Scrophularia marilandica*)
Sweet Cicely (*Osmorrhiza longistylis*)
Goosegrass (*Galium aparine*)
Golden-rod (*Solidago rugosa* and others)

These species spread only sparingly into the more acid soils and their dominance of any locality is a reliable indication that the soil there has a low acid content.

The following ten species are found growing in all types of soil on the tract and are therefore to be classed as indifferent:

New York Fern (*Aspidium noveboracense*)
Hay-scented Fern (*Dicksonia punctilobula*)
False Spikenard (*Smilacina racemosa*)
Solomon's Seal (*Polygonatum biflorum*)
Indian Cucumber (*Medeola virginica*)
Black Birch (*Betula lenta*)
Red Oak (*Quercus rubra*)
Dogwood (*Cornus florida*)
Blue-stemmed Golden-rod (*Solidago cæsia*)
White Woodland Aster (*Aster divaricatus*)

The soil reactions thus far noted represent wild locations, undisturbed by human activities. It is interesting to consider how cultivation affects the soil as regards acidity. In the vicinity of the house the surface soil was found to be practically neutral although, from its situation on a prominent ridge, high acidity would be expected. Here grading and lawn making have sufficed to bring subsoils of low acidity to the surface. In all other localities under cultivation, the acidity has also been reduced.

There are several artificial plantings of white pines on the place and it is significant to note that under them the ground covering of decomposed needles often reaches the high acidity of 300, although there is usually a rapid decrease in acidity with depth.

A peculiar condition exists as regards the acidity relations of the waters on the property. In the southeastern part there are several springs, all of which show a specific acidity of about ten. In their outlets, however, the acidity of the water diminishes until it finally becomes neutral. Dr. Wherry attributes the acidity of the spring water to dissolved carbon dioxide, which escapes or is absorbed by the adjacent soil as it runs along. These outlets empty into an artificial pond, the water of which, surprising to

state, is intensely alkaline. This is probably due to strata of limy clay which underlie the whole locality and happen to be reached at the bottom of the pond, as other springs near by show alkaline reactions and evidently rise from these clays.

This soil map and the data obtained from the soil tests are now being used as a guide for the successful introduction of large numbers of native bushes and wild flowers. Plants that can endure dryness, but require for their best development soils of high acidity, are being established on or near the summits of the ridges. Others, which do best in circumneutral soils, are to be given congenial homes in the valleys. Sphagnum moss, which is productive of acidity, is being planted in localities that are kept saturated with the acid spring water; and in the moss, acid soil plants like the orchids, the pitcher plants and other choice species, are to be grown.

Dr. Wherry, in the concluding paragraph of his article says: "It seems evident that authentic information as to the reactions of soils and waters on any property where native plants are being introduced, cannot fail to be of value in drawing plans, and in setting out, as well as subsequently caring for the plants."

A SHAPELY ARBOR VITÆ
(*See page 31*)

THE STATELY RED CEDAR

(*See page 32*)

While the red cedar frequents dry, sterile hillsides, it is also common on the margins of streams and in peaty swamps, showing its adaptability to widely differing situations. It responds well to good treatment and occasional feeding with well-decomposed manure.

The average admirer of the wild flowers and ferns, who would like to try growing them in suitable nooks and corners about his home, will not find it difficult to determine what kind of soil each species requires, if he turns to the lists in Chapters VII and VIII and notes the group to which it is assigned. He can then collect from the nearest woods sufficient soil of the sort prescribed to supply his needs, or he can give available soil the tannic acid treatment and in either case have the keen pleasure of succeeding with plants that otherwise could not be expected to survive.

CHAPTER III

Cultural Suggestions for Trees and Shrubs

The best seasons for planting trees and shrubs are early spring, when the frost is out of the ground, or in the fall, as soon as the foliage has ripened and begun to drop. In northern New York and northern New England, spring planting is generally the better practice as, unless the soil is well-drained and a heavy mulch is applied, fall planted stock, which should have sufficient time to become established before the ground freezes, sometimes fails to survive the winter.

Nursery-grown material, especially when once or twice transplanted, is more likely to thrive than that which is collected from the woods and fields. However, if they are cut back severely at the time of planting, wild trees and bushes withstand the shock of digging very well and incidentally develop a density and symmetry of growth as a result of the pruning, that improves their

appearance surprisingly. Species like the thorns, the red cedars, and others which resent transplanting, may be moved successfully if their roots are pruned six months or so in advance. This is done by digging a trench around them a foot and one half or two feet from the stem, cutting off the roots with a sharp knife, and replacing the soil. The result will be a mass of feeding roots contained in a compact ball of earth that is easily lifted and transferred without breaking to its new home.

Soil acidity has little or no effect upon the growth of trees and most shrubs because, with few exceptions, their feeding roots penetrate into and draw most of their nourishment from subsoils, which rarely show any acid reaction. Trees and shrubs, except those of the Heath family, are therefore to be classed as indifferent as far as acidity is concerned.

It is well, however, to consider their natural preferences as to soil texture, moisture, drainage and situation, and to be guided by these preferences, as far as circumstances will permit, when making selections for new plantings. Both trees and shrubs are appreciative of good treatment and will make a far more vigorous growth if planted in good topsoil, to which a liberal quantity of humus has been added.

Before planting, the roots of both nursery-grown and collected stock should be carefully examined and if any have been mutilated, they should be cut back beyond all breaks or bruises. Use a sharp knife for this purpose to insure a smooth, clean cut. Never allow the roots to be exposed to sun or wind, but keep them moist and well covered and get them into the ground as quickly as possible.

Dig the hole large enough to admit all roots without crowding or bending. Cover the bottom with a foot or so of good dirt and on this stand the tree or bush. Then throw in more dirt, working it in among the roots with the fingers or a blunt stick so there will be no empty cavities or air pockets. When the hole is nearly full, tamp down the loose soil firmly and fill with water. As soon as this has soaked in, add more dirt until even with the surface and cover with a mulch of dead leaves. In a few days the dirt in the hole will settle an inch or two forming a saucer-like depression which will catch and hold rain water where it is most needed.

Trees and shrubs that are properly planted require little after care. Nature may usually be trusted to do what is necessary for their well-being. If any fail to thrive under her

methods, the best thing to do is to dig them up and plant others in their places. However, man can do something to help them along. He can see to it that they do not crowd each other out of existence; he can water them, if the natural supply fails; he can lop off dead branches and straggling, unsightly growths; and he can keep the surface of the soil above their roots loose, cool and free from weeds. But if he attempts more than this, he is apt to do more harm than good.

In the three following chapters are listed in the order named, certain native evergreens, trees and shrubs that are particularly well suited for naturalistic landscape work and wild gardening. Some of them are well known and quite extensively used in ornamental plantings, but the majority have been ignored and "left to blush unseen" in the seclusion of their natural haunts.

Because of limited space and, in many instances, of limited information, none of the lists is by any means complete. They should therefore be considered as only partially representative of the almost inexhaustible resources of the American flora.

The nomenclature used is that adopted by Mr. F. Schuyler Mathews in his *Field Book of American Trees and Shrubs*, which

also contains illustrations and detailed descriptions of the different species listed, that will enable anyone to identify unfamiliar kinds.

AMERICAN MOUNTAIN ASH (*Sorbus americana*)
(*See page 36*)

The ruddy brown bark of our native mountain ash, and its immunity from insect pests and disease are two characteristics which should give it preference over the dull ashen bark and bug-ridden foliage of the European species, the one generally sold by nurserymen.

STRIPED MAPLE (*Acer pennsylvanicum*)
(*See page 38*)

The enormous heart-shaped leaves and greenish stem and branches, conspicuously striped with white, which characterize the striped maple, or moose-wood, are familiar to all who visit our mountain woods.

CHAPTER IV

Some Useful Trees and Tree-Shrubs

The list of evergreens, trees and tree-shrubs which follows is confined to a few kinds of medium or low growth that are particularly suited, because of conspicuous beauty of foliage or flower, for massing in copses and thickets, for small groups or individual specimens in fields and along woodland paths and watercourses, and for border plantings at the edges of woods.

In explanation of the term "tree-shrub" as used here, it should be pointed out that it is often difficult to determine whether a species should be classed among the shrubs or among the trees. As Prof. L. H. Bailey says, in his *Manual of Gardening;* "Sometimes the plant is not quite a tree and yet is something more than a shrub or bush; sometimes the plant may be distinctly a tree in its southern range and a shrub in its northern range; sometimes the same genus or group contains both shrubs and trees." As this book applies more particularly to the northern and northeastern states, I have endeav-

ored to group doubtful species according to the form they are most likely to assume in those regions.

The hemlock, the white spruce and three species of pine, all of which ultimately become large trees, are included here, because specimens under fifteen feet high are indispensable in low evergreen or mixed plantings; and also because it is a simple matter to keep them at any desired height by an annual cutting back of the new growth of the preceding year.

White Pine *Pinus strobus* — Foliage plumy, and in color a silvery, bluish-green. Needles always in bunches of five. Found naturally in light, usually sandy soil, but is not particular in this regard and will flourish in any situation in which it may be placed, provided the drainage is good.

Jersey Pine or Scrub Pine *Pinus virginiana* — A picturesque species of irregular outline, with bright, yellow-green needles, in bunches of two. It grows wild on barren or sandy land and is a unique and useful subject for planting on hills and banks where the soil is dry and sterile.

Gray Pine *Pinus banksiana* — Another scragged, picturesque tree, of lower growth than *Pinus virginiana*, but with similar foliage, and growing wild in similar situations.

Sometimes this pine is a mere spreading shrub, and this form is useful as a cover plant, in connection with tall-growing kinds.

White Spruce *Picea canadensis* — An attractive tree with numerous drooping branches and bluish, gray-green foliage. It grows wild under widely different conditions of soil and exposure, but seemingly prefers locations at a considerable altitude. It does well in cultivation, however, in any comparatively favorable situation.

Hemlock *Tsuga canadensis* — No evergreen exceeds the hemlock in beauty. The grace of its feathery, drooping branches, makes it always the most pleasing feature of any planting in which it is used. While it is found naturally in swamps and deep, rocky woods, or on mountain slopes, it thrives in almost any situation and soil, though it seems most at home in partial shade. The closely allied Carolina or mountain hemlock, (*Tsuga caroliniana*), is a much smaller tree than *Tsuga canadensis*, with denser foliage, and will tolerate dry, rocky soil and an open exposure. It can be purchased of a few growers.

Arbor Vitæ or White Cedar *Thuja occidentalis* — An ornamental evergreen, commonly ten to twenty feet high, which looks well in groups or in mixed plantings. While it grows in the wild in moist situations—

swampy places and on the banks of ponds and streams—it prospers in any situation where the soil never becomes actually dry.

Red Cedar *Juniperus virginiana* — The spire-like shape of the red cedar adds a desirable and artistic effect to any landscape planting, especially one where irregular outline is wanted. It has dark green or brown-green foliage that is variable in form, and slate-blue berries that are appreciated by many birds. It grows wild on dry, sterile hillsides, or in peaty swamps and on the margins of watercourses, but it thrives anywhere, regardless of soil or moisture conditions.

American Hornbeam *Carpinus caroliniana* — A low tree, more or less shrubby in character, with smooth, dark gray bark. Also known as blue beech. It is found in rich woods and on moist ground and is a fine subject for copses and thickets.

Gray Birch *Betula populifolia* — A common but exceedingly handsome tree, frequenting waste or burnt-over lands. If the original stem or trunk is destroyed by ax or fire, as is frequently the case, it sprouts freely from the stump, so that in places where it grows in abundance, it usually has from six to as many as fifteen stems. Its

DOGWOOD IN A WOODLAND BORDER

Photo by E. L. Crandall (*See page 38*)

SILVER BELL TREE (*Halesia carolina*)
(*See page 40*)

There are few lovelier sights in the Southern mountains than the halesia in bloom in early spring. The bell-shaped flowers, which look exactly like snowdrops, literally cover the branches and almost entirely hide the young foliage.

brilliant green foliage, in contrast with the dull white of its bark, makes it extremely effective, particularly when planted on the margins of ponds or against a background of evergreen foliage.

Paper or Canoe Birch *Betula alba,* var. *papyrifera*

This is our commonest and handsomest native birch. Its chalk-white bark and deep green leaves are conspicuous in rich woods and rocky uplands throughout our range. It is a pleasing feature in the landscape, whether planted singly, in groups, on the margins of pools and still streams, or used in the composition of copses. It is easy to establish in practically any location.

Sassafras *Sassafras variifolium*

In the northeastern states the sassafras is of low growth: in the more northern sections it is frequently shrub-like. It presents a fine appearance at any season when used in a group planting or in a border planting for woods. Its lustrous, deep green, mitten-shaped leaves change in autumn to blended opalescent tones of pinks, yellows and greens that are unrivaled for delicacy and beauty. Its fruit is a dark blue berry that ripens in August. It is found growing in a wide range of soils, is not difficult to transplant and will thrive in appropriate situations anywhere under ordinary cultural conditions.

American Crab *Pyrus coronaria* — A not uncommon, round-topped low tree of our thickets and hedges, noted for its masses of extremely fragrant pink and white flowers in May. It is easy to establish and should be included if possible wherever it is desired to imitate the natural plantings in which it plays so conspicuous a part.

Mountain Ash *Pyrus americana* — A very ornamental low-growing tree, with compound leaves and crowded clusters of bright coral-red fruit, the size of small peas, on slender, dark red stems. The fruit ripens in early autumn and persists well into the winter. While the mountain ash is a denizen of upland woods and mountain slopes, it takes kindly to cultivation and, because of its brilliant fruit, is well worth considering as a feature of any planting.

The Hawthorns *Cratægus* species — The thorns native to America comprise about two hundred species, according to the botanists, but the differences between most of them are so slight that, to the average observer, a thorn is a thorn, regardless of its botanical classification. The hawthorns are in the foremost rank of our native flowering and fruiting trees, as regards beauty of form, flower and fruit. The blooming season for the clouds of white flowers is May and the

fruit, which is usually a deep or scarlet red, is ripe in October. Nurserymen offer only a few species in their catalogs—generally the cockspur thorn (*Cratægus crus-galli*), the Washington thorn (*Cratægus phænopyrum—C. cordata* of dealers), the red-fruited thorn (*Cratægus mollis*) and two or three European species. In their larger sizes, the thorns are extremely difficult to transplant and establish, even when nursery-grown. The best plan is to dig small specimens, two to four feet high from the fields and pastures where they grow naturally; for these, with few exceptions, take hold quickly and will soon make a fine showing wherever they may be located.

Bird Cherry *Prunus pennsylvanica* Usually a small, delicately branched tree with rather thin foliage and tiny white flowers in clusters. It is valuable because of its translucent red fruits, which are greatly relished by all birds. They are ripe in August and September. The bird cherry is common in rocky woods. It is easy to transplant and establish in any desired location.

Redbud *Cercis canadensis* One of our handsomest flowering trees, its crimson-magenta flowers appearing in early spring before the leaves. The latter are large, heart-shaped, and in color, a glossy dark green. A charming and harmonious compan-

ion for the redbud is the shadbush (*Amelanchier canadensis*). The redbud grows naturally in rich bottom lands, on the borders of streams. It is not difficult to handle and seems to do well in ordinary soil and practically any location, though nursery-grown specimens are more certain to succeed.

Striped Maple *Acer pennsylvanicum* A small, slender tree notable for its greenish-brown bark, freely striped with yellowish white, and its unusually large, dark green leaves. It is common in cool, rocky, upland woods and improves considerably under cultivation. It is a very desirable addition to any group planting or as a feature of a wooded slope.

Red Maple *Acer rubrum* This superb but medium sized tree should not be omitted from any border planting. It is also especially fine and striking used as an individual specimen, particularly in rather low, moist situations. Its color is scarlet-red the year round —red blossoms in spring, red twigs in summer, red leaves in autumn and red buds in winter. While it grows naturally in swamps or wet woods, it will thrive in any location where the soil is constantly moist.

Flowering Dogwood *Cornus florida* Our most beautiful and picturesque flowering tree—attractive at all seasons, either because of its masses of white bloom, or its unique

THE RED-BUD OR JUDAS TREE
Cercis canadensis

The Pink-flowering Dogwood
Cornus florida rubra

foliage, or its deep scarlet fruit, which persists well into the winter months. Common in woodlands everywhere, but not easy to transplant from the wild. Should be purchased from growers. There are pink and red-flowered varieties which are extremely attractive when used in combination with the white-flowered kind.

Yellow Wood or Virgilia *Cladrastis lutea*

This rare and conspicuously handsome native tree has many delightful characteristics. Its short trunk, numerous ascending branches and broad, rounded top give it an aspect of exceeding grace and beauty at any season; and during May and June, when its creamy white, deliciously fragrant blossoms appear, it is really superb.

The cladrastis is a near relative of the locusts and like them has compound leaves, which consist of from five to eleven leaflets. The sweet pea-like flowers are in drooping terminal panicles, ten to twenty inches long. The color of the foliage is a brilliant green, turning to bright yellow in autumn.

In cultivation, the cladrastis has proved hardy as far north as New York and New England. It is not particular as to soil, although in its natural haunts (a restricted region in the Blue Ridge mountains) it apparently prefers the rich, alluvial soil of the

river bottoms. It makes a particularly fine individual specimen and is equally effective in mass plantings. The wood yields a clear yellow dye, which accounts for one of its common names.

Tupelo or Pepperidge Tree
Nyssa sylvatica

The irregular habit of this extremely handsome tree gives it an aspect that is quite Japanesque. It has lustrous dark green foliage which turns to a brilliant crimson in autumn. Its fruit is a purple-blue berry, ripe in September. In the wild it is usually found along watercourses in rich alluvial soil and it is not easy to establish in locations having different conditions of soil and moisture. The tree, however, is so unique and attractive that it is well worth attempting to grow it in situations where it will show to advantage.

Snowdrop or Silver Bell Tree
Halesia carolina

A very beautiful flowering tree-shrub native to the Virginia and North Carolina mountains, growing in the north from eight to sixteen feet high. The elegant, snow white flowers appear in early spring simultaneously with the leaves. They are bell-shaped, with four petals, and are borne in slender drooping clusters. The leaves are from two to six inches long, elliptical in shape, deep green on the upper surfaces and paler beneath.

This desirable shrub can be obtained of most nurserymen and is an excellent subject in the composition of copses. It succeeds in almost any situation, though I find it somewhat difficult to establish unless purchased in the smaller sizes, not exceeding three to four feet in height.

CHAPTER V

Wild Bushes of Notable Beauty

Nearly all the shrubs in the following list are remarkable for the beauty of their flowers, besides being attractive in foliage and habit. Some, however, are chosen for their brightly colored, conspicuous fruit and others for the pleasing effects in winter produced by their evergreen foliage or bright-hued stems.

Native shrubs are indispensable for planting the borders of woods and thickets, for low screens defining boundaries, and for "planting out" unsightly objects. They are also useful for covering banks, for grouping in broad masses on the margins of lakes and streams and for various underplantings in woodlands.

Still another purpose for which wild bushes should be utilized is the decoration of roadsides where, if present, they should be protected and their growth encouraged and, if absent, they should be planted liberally. Yet,

in some states, property owners are compelled by law to either keep the roadside bushes cut to the ground, or to destroy them altogether. Mrs. Harriet L. Keeler, in her admirable book, *Our Northern Shrubs*, says in this connection; "It is difficult to comprehend why our country roadsides are so generally forlorn, cheerless, barren and desolate. Were the wild growth of shrubbery encouraged, cared for and properly controlled, Nature would decorate them with a generosity that no Park Commissioner could emulate. With very little or no expenditure of money, and with a minimum of intelligent care and protection on the part of the owners of the land, the country roadside might be a source of pleasure to all who pass, as well as a most valuable arboretum of the native flora."

The success of any shrubbery planting is dependent upon the healthy and vigorous growth of the material. Care should therefore be taken to select species that are best suited to the locality in which they are to be established. This should not be a difficult matter if the descriptions here given are carefully studied, for the cultural preferences of each shrub are clearly indicated by the information given regarding the natural conditions of their native habitats.

Common Juniper *Juniperus communis*

The grayish-blue plumes of this low evergreen bush give a pleasing variety to the color tones of dry hillsides and rocky pastures in the higher regions of the northern states; and it is equally effective when used as a cover for barren spots on slopes and ridges where so few plants will grow. It is characterized by its erect, branching habit, its dense, sharp-pointed needles and its peculiar fruit. This, when young, is a sage-green berry, with a bloom, which changes to a slaty-gray color at maturity. It has a sweetish taste and is well-liked by many birds. The variety *depressa* grows in similar, or even more exposed situations, where it forms broad, prostrate mats, the branches radiating and branching upward from the center to a height of from one to three feet. The needles are shorter and the berries larger than those of the type. Still another and even more prostrate variety is *montana*, which is indigenous to rocky barrens along the coast of Maine and northward. All three kinds are valuable for cultural purposes, as they are extremely ornamental and easily grown in any location or soil.

Few woodland sights are so exquisitely beautiful as a carpet of the richly colored, trailing American yew covering the floor

AMERICAN YEW (*Taxus canadensis*)
(*See page 47*)

SWEET BAY (*Magnolia virginiana*)
Photo by C. R. Shoemaker (*See page 50*)

THE GLORIOUS SHADBUSH

(*See page 57*)

of a hemlock grove. And it is just as charmingly effective in other shaded situations provided the soil is rich with humus and kept cool and moist. In unusually favorable locations it often forms a spreading clump two to three feet in height. One of these tall clumps near Salisbury, Conn., is fully six feet in diameter. The American yew has needles resembling those of the hemlock, but very dark, glossy green above and a bright yellow-green beneath. The noticeably attractive fruit is a clear, translucent red berry, with a cup-like depression at the bottom of which appears the tip of the black seed. The berry has a resinous taste and is ripe in August. Certain birds are extremely fond of it. The plant is easy to grow in congenial locations, as noted above, and makes a fine ground cover under rhododendrons and laurel.

American Yew or Ground Hemlock
Taxus canadensis

Sweet Gale
Myrica gale

A neat, low growing shrub with wedge-shaped, dark green leaves that are leathery in texture and spicily fragrant when crushed. The color is dark green above, much paler beneath. The flowers are in catkins and not conspicuous. They are followed by waxy berries in clusters. The sweet gale is frequent on the margins of ponds and streams, particularly in moun-

tainous regions. It grows to a height of four or five feet, responds readily to cultivation and is both useful and beautiful in situations similar to those in which it grows naturally.

Bayberry *Myrica carolinensis* — This compact little shrub, usually only two to three feet high, with its rich, dark green, fragrant foliage and waxy, white berries, cannot be surpassed as a cover plant for banks and hillsides where the soil is dry and sterile. While its preferred habitat is near the coast, it finds no fault with the interior and will succeed under seemingly adverse conditions anywhere. The fruit of this shrub is used in the manufacture of the green bayberry candles which are in such great demand at Christmas time.

Sweet Fern *Myrica asplenifolia* — This fern-like shrub, which, however, is not a fern, is a fine and thrifty companion for the bayberry in the same situations and soils. It grows only one or two feet high, from long, creeping roots and is a difficult subject to transplant from the wild. Its dark green leaves are fragrant when crushed, like the other *Myricas*.

Hazelnut *Corylus americana* — This decidedly good-looking shrub grows from four to eight feet tall and has rough, dark green leaves and brown stems. The flowers

are borne in catkins, three to four inches long, and are followed by the well known sweet, brown nuts. They are ripe in September. There is another species, *Corylus rostrata* or beaked hazelnut which, in my opinion, is the handsomer plant. The bristly covering of the nut of *rostrata*, terminates in a long tubular beak which is lacking in the other species. The hazelnut is abundant in hedgerows and roadside thickets and should be planted in similar situations.

Speckled Alder *Alnus incana*

The drooping purple and yellow catkins of the speckled alder are about the earliest harbingers of spring. This is the common brookside alder familiar to all country lads, who, from time immemorial, have made whistles from its slender stems and used the straightest ones for fish poles. It is a handsome shrub, eight to twelve feet high, with dark green foliage and reddish bark, speckled with horizontal oblong indentations of a grayish tint. There are few of the streams which meander through our fields and pastures whose banks are not fringed, at frequent intervals, with its overarching boughs. It is therefore useful in the composition of many landscape pictures, if only to define the course of a winding brook through a sunny meadow. Young specimens are easily transplanted.

Spice Bush
Benzoin æstivale

In late March and early April the pale yellow blossoms of the spice bush give a pleasing touch of color to wet woods and swamps. The flowers are crowded along the twigs and appear before the large, shapely leaves begin their development. This is a trim, fine appearing, densely foliaged shrub that grows from six to twelve feet high and is easy of cultivation, taking kindly to any situation where the soil is fertile. It has other attractive characteristics besides its flowers—among them its clusters of bright scarlet berries, ripe in September, the brilliant gold of its leaves in autumn, and the spicy aroma and taste of its bark, foliage and fruit.

Sweet Bay
Magnolia virginiana

In the north the sweet bay is a highly ornamental semi-evergreen shrub, three to ten or twelve feet high, but it increases in size southward until in Texas it becomes a tree seventy feet high with a trunk diameter of three feet. The color of its elliptical leaves is a handsome glossy green, whitish underneath, and it bears in May and June very beautiful creamy white flowers about two inches broad, which are deliciously fragrant, and are followed by pink, oval shaped fruits. The sweet bay grows naturally on the borders of swamps from Gloucester, Massachu-

setts, along the coast to Florida, and thence west to Texas. It thrives, however, in any reasonably moist situation. It is a difficult subject to transplant and establish, unless dug in the spring just as the new growth is starting, when success may be expected in most instances. The value of the sweet bay in landscape work is not sufficiently appreciated, notwithstanding the fact that it is considered so attractive by wild flower vandals that it is being rapidly exterminated. It is therefore one of the plants mentioned by the wild flower preservation societies as needing special protection.

Wild Hydrangea *Hydrangea arborescens*

A low, widely branching shrub frequenting the rocky banks of streams, that shows marked improvement in every way under cultivation. The leaves are large, heart-shaped, and of a deep green color, paler beneath. The pinkish flower clusters in the type are staminate and small, with only occasionally a few white sterile blossoms showing on the margins but in the garden variety, *Hydrangea arborescens grandiflora*, popularly called "Hills of Snow," the numerous fertile flowers have all been transformed into sterile flowers, forming large showy racemes. A similar and extremely attractive southern species, *Hydrangea cine-*

rea (*radiata* of dealers) is distinguished by the light gray, sometimes almost white pubescence covering the under sides of the leaves. This feature is especially conspicuous on breezy days.

Witch Hazel
Hamamelis virginiana

While the foliage of surrounding bushes and overarching trees is falling in late autumn, the golden yellow flowers of the witch hazel appear in "tousled clusters" in the axils of its dying leaves. Each blossom has four long, crumpled narrow petals that are curiously curled and twisted. The whole aspect of the bush at this season is weird, almost spectral in certain lights, but its esthetic beauty cannot be disputed. Whittier paints a graphic picture of the witch hazel in these lines:

> Through the gray and somber wood,
> Against the dusk of fir and pine,
> Last of their floral sisterhood,
> The hazel's yellow blossoms shine.

This witch hazel varies from eight to twelve feet in height and is most frequent on the slopes of deep shaded ravines or in the bordering thickets of forests. Its leaves are asymmetrical—that is, they are noticeably narrower on one side of the midvein than on

the other. The fruit is a nut-like capsule containing four shiny brown seeds which take nearly a year to ripen. At maturity the capsule bursts with a report like a popgun, scattering the seeds in every direction. The witch hazel is an excellent shrub for thickets and copses, and for massing on the edges of woodlands.

Virginia Itea or Chaste Shrub
Itea virginica

The chief attractions of this notably ornamental, medium-sized shrub are its spikes of bell-shaped, snowy blossoms in May and June, and its brilliant panoply of crimson and scarlet foliage in late autumn. It is a denizen of southern swamps, but flourishes with equal luxuriance in much dryer situations. It makes a charming companion for the sweet pepperbush (*Clethra alnifolia*) which blossoms later, and is particularly desirable for planting on the edges of fields and along watercourses. It is entirely hardy and can be purchased of most nurserymen.

Nine-bark
Physocarpus opulifolius

The nine-bark is one of the few native shrubs whose merits have been given recognition by nurserymen and landscape architects. It is therefore frequently used in the composition of shrubbery groups in parks and on the borders of lawns. It is characterized by

dark green, three-lobed leaves, rounded spirea-like clusters of white blossoms and purplish-pink, inflated fruits, the latter persisting until early winter. Its cinnamon-colored outer bark splits lengthwise into thin, ragged strips, hence its common name. The nine-bark grows naturally on rocky banks, preferring the vicinity of streams, and ranges in height from four to ten feet. As it blooms in June, when most shrubs are through flowering, it is of unusual value in massed plantings where continuous color effect is desired.

Red Chokeberry *Pyrus arbutifolia*

A particularly ornamental shrub at all seasons and one which merits greater consideration than it usually receives. It is medium sized, from four to seven feet high, and is notable for its elliptical, pointed, dark green leaves, its conspicuous terminal clusters of white or pink-tinged flowers, its bright garnet-red berries, and its gorgeous autumn dress of orange-gold and crimson-scarlet foliage. It grows naturally in open swamps and low, thin woods, but, while it thrives best in similar locations, it is not fastidious in its cultural requirements and is available for use wherever its striking colors will show to advantage. Its near relative, the *black* chokeberry (*Pyrus melanocarpa*) is

A BORDER PLANTING

Photo by E. L. Crandall

MEADOWSWEET (*Spiræa latifolia*)

Photo by C. R. Shoemaker (*See page 84*)

THE HOBBLE BUSH IN FRUIT

(*See page 78*)

similar in habit and flower, but the color of the fruit is purple-black. Both species are offered by dealers, or may be transplanted without difficulty from the wild, if young bushes are chosen.

Shadbush or Serviceberry
Amelanchier canadensis

The snowy wreaths of the shadbush announce the definite arrival of spring, appearing on hillsides and in dry, open woods everywhere, along with the bloodroots, hepaticas, and trilliums. The blossoms open before the lustrous green leaves have fully unfolded and are followed by the sweet, edible crimson fruits, which are known popularly as June or serviceberries. These berries, while ornamental, furnish such a royal feast for the birds that they quickly disappear. The autumn coloring of the shadbush is a rather somber and rusty red, but until then it is a decidedly neat and handsome shrub. There are many variations and forms of *Amelanchier* which some botanists are inclined to regard as distinct species. *A. canadensis* is typical, however, and the one most generally employed in landscape work. The shadbush is most effective as a border shrub. It is especially fine as a companion for the redbud (*Cercis canadensis*) or in close proximity to the spice bush (*Benzoin æstivale*).

Beach Plum *Prunus maritima*

This low, picturesquely straggling shrub grows in clumps and patches in dry, sandy places, along or near the sea coast. It is rarely over three feet high and early in May its branches are covered with snow-white blossoms which do not fade for many days. The round fruit is a deep bright red or purple, with a bloom, and is juicy, edible and much used for preserves. In autumn the foliage turns to dull red or orange. The beach plum is easy to transplant with ordinary care and is just the thing to group with the bayberry, the sweet fern, the dwarf blueberry and the bristled aster, on dry, sterile banks and hillsides where few other plants can exist.

Lead Plant *Amorpha canescens*

This odd, fuzzy, but elegant little shrub rarely reaches four feet in height and is a native of the western prairies. Its stems and its thickly set leaflets are densely clothed with silvery hairs, giving the whole plant a grayish aspect that contrasts finely with the spikes of violet-blue flowers. The beauty of the blossoms is intensified by their brilliant orange stamens, and they persist in good condition for several weeks, appearing from mid-June until August. As blue-flowering shrubs are scarce, the lead plant adds an

unusual color note to any planting, and during a season when there are few flowers in evidence.

False Indigo *Amorpha fruticosa* This shrub resembles the lead plant in many respects, but is much taller (four to fifteen feet) and lacks the downy covering of leaves and stem. The leaves are larger and less crowded and the violet-purple flowers bloom in May and June. It grows wild on river banks in the central states and has long been cultivated for ornamental effects.

Rose Acacia *Robinia hispida* The rose-pink blossoms of this native of the Blue Ridge mountains and its propensity to form dense clumps by sending out suckers, are two characteristics that make it an admirable shrub for thickets. Its branches and twigs are so thickly covered with bristling hairs as to give them a mossy appearance. The pea-shaped flowers are produced during May and June in drooping racemes. The rose acacia and the very similar species *Robinia viscosa*, known as the clammy locust, have been cultivated in the north and east for many years, are perfectly hardy, and can be obtained of growers.

Hop Tree *Ptelea trifoliata* This rather tall, often tree-like shrub has considerable decorative value because of the marked contrast

between its dark green leaves and the white-green clusters of wafer-like seed vessels, which are produced freely and mature in late July. It grows wild in rocky woods, but is propagated by nurserymen and used considerably in cultivation. Its most effective position is in the center or rear of shrubbery groups.

The Sumacs *Rhus* species

The wonderful decorative beauty of the sumacs is little appreciated. Like most "common" plants they are too often heedlessly classed with the weeds and considered fit for nothing but the ax and the grub hoe. Fortunately, however, this is usually an entirely unprejudiced mental attitude which it is not difficult to change into one of intense admiration. I once saved a magnificent clump of *Rhus copallina* from total annihilation by pointing out to the owner the particularly fine effect of its masses of dark shining foliage and telling him of the gorgeous colors it would assume in autumn. As a result, orders for its destruction were countermanded and to this day whenever that gentleman takes his guests on a sight-seeing tour of his place, he first shows them his "shining sumacs."

The tallest and most picturesque member of the sumac tribe is the staghorn (*Rhus typhina*) so-called because of its velvety,

SHINING SUMAC (*Rhus copallina*)
(*See page 63*)

All the sumacs secrete a retinous, milky juice, which is used in the manufacture of copal and other varnishes. A species native to Japan, supplies the chief ingredient of the famous Japanese lacquer.

SILKY CORNEL (*Cornus sericea*)

(*See page 71*)

The Indians called this shrub Kinnikinnick and mixed its reddish bark with their smoking tobacco because of its supposed tonic effect. The leaves underneath are covered with fine, silky hairs.

forked branches. This species grows naturally in dry, gravelly or sandy soils, forming dense and extensive thickets which are frequently bordered with the similar, but smaller, smooth sumac (*Rhus glabra*). The conspicuous maroon-red fruits of the staghorn are conical shaped and persist through the winter with little change of color. There is a cut-leaved variety of this species which has exceedingly ornamental foliage and is frequently used in cultivation as a lawn specimen.

The mountain sumac (*Rhus copallina*) is a handsome species that is distinguished by its glossy green leaves and by the *wings* along both sides of the stems, between the leaflets. Its foliage in autumn assumes the most brilliant hues imaginable—a superb blending of rich crimson and glowing scarlet.

The fragrant sumac (*Rhus canadensis*) is the lowest grower of the family, rarely exceeding four or five feet in height. Its handsome, scalloped, compound leaves, in threes, are fragrant when crushed and are produced in billowy masses, completely hiding the straggly stems. In autumn they display the tribal colors, orange and scarlet. This species is unrivaled as a cover for banks, or as an undershrub for taller bushes and looks most attractive where its tumbling branches can

spread over the ground without restraint. It is usually listed by dealers as *Rhus aromatica*.

The American smoke-tree. (*Rhus cotinoides*) is a rare species of sumac indigenous from the Cumberland Mountains in Tennessee to Oklahoma and Texas. It is a very beautiful tall shrub, especially when its fruiting panicles in early summer develop the masses of plumy threads that so resemble smoke and give the shrub its popular name. A similar, but European species (*Rhus cotinus*) is the one that is commonly planted in cultivated shrubberies and I suppose there is no valid objection to its use in natural plantings, particularly as the native species is not usually sold by nurserymen. In fact I, personally, "could be happy with either were t'other dear charmer away."

The American Holly *Ilex opaca*

The impression prevails that this native evergreen holly is not hardy north of the latitude of New York City, nor anywhere in the interior north of the Ohio River. It is my opinion that this is a mistake and that its successful cultivation is a question of location, soil and moisture rather than of temperature. The natural habitat of the holly is "moist woodlands," or "in sheltered situations in sandy or moist soil," from Massachu-

setts to Florida, near the coast. In the southern part of its range, it extends its haunts inland to Missouri, Arkansas and Texas. It is abundant on Cape Cod and in Rhode Island, where the winter temperature frequently goes below zero. In view of all this, there is no apparent reason why it should not thrive anywhere, provided it can be given conditions similar to those under which it grows naturally. Therefore, everyone who is interested in the preservation of this rare and beautiful native plant should make an earnest effort to establish specimens in congenial and protected locations. Young holly plants obtained from a nursery are usually certain to succeed. The very excellent suggestion has also been made that those who buy holly for Christmas decorations and have facilities for growing it from seed, should use the berries for this purpose instead of consigning them to the trash heap. Under no circumstances should any attempt be made to transplant bushes from the wild. They hardly ever survive and there are none to spare. The American holly is very similar to its English cousin, but lacks the glossiness of foliage and fruit that is characteristic of the latter. In the north it is a compact, handsome shrub, sometimes fifteen feet high or more, but in the south it

is tree-like and grows to a height of from thirty to forty feet.

Winterberry or Black Alder *Ilex verticillata*

The last and brightest color display of the year is made by the scarlet berries of the black alder. Long after the trees have shed their flaming autumn coats, and even after the fantastic yellow blossoms of the witch hazel have faded, this handsome shrub lights up the swamps and wet thickets like a flaming torch, so densely do the glowing fruits crowd its numerous branches and stems. It must be that very few know of its adaptability for cultivation or it would be more frequently used in landscape planting. As it is, no other native shrub, with any claim to beauty, is so generally ignored and neglected and it is obtainable of very few growers. The winterberry reaches a height of from six to twelve or fifteen feet, and is attractive at all seasons, although it is deciduous and the white flowers in June are inconspicuous. Those who appreciate a bit of brilliant color in early winter, will especially enjoy the effect of a bush here and there against a background of hemlocks or cedars. It is also a fine subject for mixed plantings of evergreen and deciduous shrubs and trees, as in thickets and copses.

European connoisseurs have extolled the

The Inkberry
Ilex glabra

beauties of the evergreen inkberry for more than a century, yet in this country it is even less generally known than the winterberry. In the wild it is apt to be of a straggling habit, but under cultivation, it becomes a compact and symmetrical low bush, two to four feet in height, that is unsurpassed for borders or low mass plantings, particularly in sandy places. The bright evergreen leaves are slender, of leathery texture, and are gracefully arranged in bunches. The fruit is a lustrous black berry, which persists through the winter, and gives the plant its popular name.

Mountain Holly
Nemopanthus mucronata

This densely branched, neatly constituted shrub, is a native of cool, damp, upland woods, but it sometimes strays into the lowlands. Its attractive features are its plentiful light green leaves, its ashen-gray branches and twigs, and its crimson-red berries, which are borne sparingly on long stems and are ripe in August. In cultivation it rarely exceeds five feet in height and is decidedly ornamental in shaded situations, where its pale greens and grays are contrasted with foliage of darker hues.

In September, when the crimson seed capsules of the burning bush burst and disclose the brilliant orange-scarlet seeds within, its

The Burning Bush *Evonymus atropurpureus*

popular name seems very appropriate. These glowing fruits are characteristic of all the members of the Staff Tree family (*Celastraceæ*), which includes the well known climbing bitter sweet (*Celastrus scandens*), several species of *Evonymus* and a very neat low-growing, evergreen shrub (*Pachistima canbyi*). In the north the burning bush is a slender good-looking shrub, with winged, grayish stems, and bluish-green foliage. In the south, however, it becomes tree-like, reaching a height of twelve to eighteen and sometimes twenty-five feet. The strawberry bush (*Evonymus americanus*) is similar in foliage and fruit, but much smaller. *Evonymus obovatus* is a closely related, trailing species that makes a very serviceable and ornamental ground cover for banks and barren places, growing equally well in either sun or shade. All the species named thrive and improve in appearance under simple cultural treatment, and are well worthy of consideration in suitable situations.

American Bladder Nut *Staphylea trifolia*

A tall and slender shrub of rapid growth characterized by green-striped, light gray stems, deep green, compound leaves (in threes) and conspicuous inflated seed pods. These pale green "bladders" are borne

in profusion and are about two inches long. This is a bush of the thickets, which, when given a position where it is not so closely crowded as in its natural haunts develops unsuspected beauty and symmetry. It is easy to transplant and makes a fine appearance, either behind shrubs of lower growth, or as an isolated specimen.

New Jersey Tea
Ceanothus americanus

Attractive flowering shrubs of low growth, that will thrive in poor, dry soil, are in great demand but by no means numerous. The ceanothus, therefore, is a real treasure with its compact habit, pleasing foliage, and plumy white flower clusters. It grows abundantly in dry open woodlands and on gravelly slopes and shores. It transplants readily and makes a fine showing as a cover for barren places, when combined with such things as the bristled aster, the orange butterfly weed, the liatris, and the wild lupin. On the Pacific coast, there are several species of ceanothus which have flowers of brighter colors, including blues and pinks. These seem to do well in the East, but are little known here. They should be used much more extensively.

Stewartia
Stewartia malachodendron

Few flowering shrubs are more ornamental in both foliage and flower than this rare native of the southern Alleghanies. It has large, waxy,

cream-white blossoms, three to four inches across, that are sweetly fragrant and not unlike a single camellia. The camellia, by the way, is a near relative. The heavy, deep green leaves of the stewartia turn a rich crimson in autumn. It is perfectly hardy in the Arnold Arboretum, near Boston, but should be given a sheltered situation when planted north of the latitude of New York City. It blooms in May. A closely allied species (*Stewartia pentagyna*) has larger leaves and blossoms a little later. There are a few nurserymen who offer the stewartia and an occasional specimen is always a very desirable and striking object.

Leatherwood or Moosewood
Dirca palustris

The moosewood, or wicopy, as it is often called, is a low, picturesque and remarkably stocky, or stubby bush, with a thick protruding root or trunk, from which spring numerous curved branches one to one and one-half inches in diameter and two to four feet long. The dull-green, egg-shaped leaves, develop with or closely follow the pale yellow flowers, which appear in clusters of three or four in April. The autumn color of the foliage is bright yellow. The moosewood grows naturally in damp woods and pastures, but is not fastidious in cultivation, thriving in any fairly good soil. It may be used with advan-

tage to brighten dark nooks and corners in woodlands and copses.

The Bush Dogwoods *Cornus* species

Our native bush dogwoods are among the most useful and ornamental shrubs in existence and are never out of place in an American landscape. Besides *Cornus florida*, the flowering tree, and *Cornus canadensis*, the little herbaceous bunchberry, Mathews lists six species indigenous to the eastern states that may be considered as bushes, namely: the round-leaved dogwood (*Cornus circinata*), the silky cornel, or kinnikinnik (*C. amomum* or *sericea*), Bailey's cornel (*C. baileyi*), the red osier, or red-twigged dogwood (*C. stolonifera*); the panicled or gray dogwood (*C. paniculata*) and the alternate-leaved dogwood (*C. alternifolia*). These are all easily transplanted and established and thrive in almost any situation. The blooms are much alike, appearing in flat, roundish clusters made up of small, four-pointed, individual flowers, of a creamy-white or yellowish-white tint. The handsome fruits vary in color. They are white on *C. baileyi*, white, with bright red stems on *C. paniculata*, dull white to lead color on *C. stolonifera*, pale blue on *C. circinata and C. amomum*, and deep blue with reddish stalks on *C. alternifolia*. Many people confuse the bush dogwoods with the viburnums,

which are of similar aspect. It is easy to tell one from the other, however, if the observer remembers that the parts of the dogwood flowers come in fours, while those of the viburnums are in fives. In naturalistic plantings, where large masses of shrubs are desired for any purpose, no esthetic mistake will be made if they are composed principally of dogwoods.

White Alder or Sweet Pepperbush *Clethra alnifolia*

Araby the blest has no spicy odor that can match in pungent sweetness that of the snowy spikes of the clethra. It is nature's most delightful and most tantalizing fragrance—nothing insipid or cloying about it—but a fragrance with a tang that makes the nostrils tingle and creates an insatiable desire for more. The sweet pepperbush loves to congregate along the banks and on the islets of meadow brooks and woodland streams. Its blossoms are borne in profusion at the ends of brown, branching stems, or at the bases of the terminal leaves, and appear above the dark green foliage during July and August when those of most shrubs are faded and gone. In the wild, the clethra is of straggling habit, rarely over four or five feet in height. Under cultivation, however, even in dry, poor soil, it becomes a tall, symmetrical bush of

remarkable beauty at any season. There is a superb specimen on a lawn not far from my home that stands fifteen feet high by actual measurement and bears its perfumed blossom spikes by the hundreds. Every summer, large numbers of people walk long distances to see and smell them and the atmosphere of the entire neighborhood is saturated with their fragrance. The sweet pepperbush is one of the few native shrubs that is frequently cultivated and most nurseries can supply stocky young plants, which will grow rapidly. They should be grouped in good sized clumps and look especially well on the edges of woods and fields, or in the bends of winding streams.

Fringe Tree
Chionanthus virginica

In the southern states the fringe tree or "old man's beard" is often a tree eighteen to thirty-five feet tall, but in the north it becomes a stately shrub of moderate height, usually not exceeding eight to ten feet. The flowers, in May and June, are arranged in loose, drooping clusters, their long, narrow, snowy-white petals giving them a very graceful, fringe-like appearance. When used as an isolated specimen, the fringe tree makes a round-topped, symmetrical bush of pleasing and striking aspect, notwithstanding its somewhat coarse foliage and

stout, irregular branches. It is also admirable as a "punctuation mark" in a clump of lower growing shrubs. Though a native of moist copses and thicketed river banks, it presents no difficult cultural problems in other situations, and may be purchased of most dealers.

The Buttonbush *Cephalanthus occidentalis*

The singular, creamy-white blossom balls of the buttonbush are composed of numerous tiny flowers with long, thread-like pistils and look for all the world like so many little pincushions. During July and August they appear in profusion above the shining green of the foliage and last for weeks without fading. They have a delicate, pleasant, honey-like fragrance that evidently serves as a lure for the bees, as these busy nectar-hunters are never absent, nor do they ever seem to go away empty-handed. The buttonbush is a rather common low shrub of our swamps and in low moist spots along streams. It is much admired and planted in Europe, but is rarely seen in cultivation here at home. As it does not usually exceed five feet in height, and is not at all particular in its requirements, it is a very useful shrub for underplantings anywhere.

The bush honeysuckle of our dry hillsides and rocky woods is a near relative of the well-known garden weigela, having simi-

Bush Honeysuckle *Diervilla lonicera*

lar rather coarse foliage, but much less conspicuous flowers. These are bright yellow, funnel shaped, and are usually borne in clusters of three. The chief merit of the bush honeysuckle is its adaptability for covering dry, shaded areas where so few things will flourish. It combines and contrasts well with the *zanthorhiza*, or yellowroot. Closely related are two or three other native species of honeysuckle—the mountain fly honeysuckle (*Lonicera cærulea*), with cadet-blue berries; the American fly honeysuckle (*Lonicera canadensis*), with deep red berries; and the swamp fly honeysuckle (*Lonicera oblongifolia*), with crimson berries. All three have similar yellowish flowers and are described in detail in Mathews' *Field Book of American Trees and Shrubs*, pages 388 to 390. None of the native honeysuckles except *Diervilla lonicera* is sold by dealers, as far as I know, but they can all be located in the wild if desired, and transplanted without difficulty.

The Snowberry *Symphoricarpos racemosus*

The snowberry or waxberry, although a native shrub, was a common "front yard" bush a hundred years ago, where it flourished alongside the cabbage roses, the "syringas," the lilacs and the flowering currants so beloved by our great grandmothers. It is still used

occasionally in large lawn shrubberies, particularly in situations where its shade-loving disposition can be humored to advantage; and I would like to see it oftener in wild plantings where it really belongs. The cultivated snowberry is really a tall variety (*lævigatus*) of *S. racemosus*, with larger clusters of flowers and more and larger berries than the type. It is indigenous to the Alleghany mountains. There are two other forms which are hardly worthy of consideration from a cultural standpoint. The snowberry has a poor relation—the Indian currant (*Symphoricarpos orbiculatus*), which, for some inexplicable reason, is widely planted as an ornamental shrub. To me, it is altogether ugly with its stiff stems, weedy appearance and dull magenta berries. Its only merit, as far as I can discover, is its low habit of growth. Yet there are dozens of low growers that are as beautiful as it is hideous, and that will thrive wherever it does.

The Arrow-woods *Viburnum* species

In the states east of the Mississippi River the viburnums are represented by fourteen species of shrubs and one tree, of which the handsomest, best known and most easily obtainable are the following: Hobble bush (*Viburnum alnifolium*); highbush cranberry (*V. opulus*); dockmackie (*V. acerifolium*);

downy arrow-wood (*V. pubescens*); arrow-wood (*V. dentatum*); withe-rod (*V. cassinoides*) and nannyberry (*V. lentago*). The black or plum-leaved haw (*V. prunifolium*), is a decidedly picturesque tree-viburnum, with distinctive foliage and blue-black fruit on red stems. Of the shrubby species, the high-bush cranberry is unquestionably the most beautiful. Of stately bearing, with dense, maple-like foliage, which in autumn changes to reds and purple-bronze, glorious in its pure covering of snowy flower clusters and gorgeous later when its branches are loaded with the bright, translucent, scarlet berries, it stands at all times, conspicuous in the landscape—the admired of all beholders.

Next in loveliness among this bevy of beauties is the withe-rod (*V. cassinoides*), of which Harriet L. Keeler writes in *Our Northern Shrubs:* "In its wild home, it is a loose, straggling shrub, but in cultivation . . . it becomes compact, symmetrical, an ornament to the race, and the flower of the family." While the flower clusters of the withe-rod lack the showy sterile, marginal blooms of the highbush cranberry, the fruits which follow change in bewildering fashion from pale green to pink and then to slate blue, berries of each color often showing simultaneously.

The downy arrow-wood (*V. pubescens*), like the withe-rod, responds to cultivation by becoming a dense, almost globular bush, upon which the lustrous purple-black berries show to great advantage. Both *V. cassinoides* and *V. pubescens* display autumn colors of similar hues to those of *V. opulus*.

The four other viburnums named as desirable are fully described on pages 392 to 399 of Mathews' *Field Book of American Trees and Shrubs*.

The fruits of the hobble bush are scarlet or coral red; of the dockmackie, dark violet-blue; of the arrow-wood deep blue-black and of the nannyberry, cadet blue with grape-like bloom. When large clumps of the viburnums are massed with the bush dogwoods, the display of red, white and blue berries is simply magnificent. And the effects produced by the broad sheets of white bloom, and the contrasting shades of green foliage, are equally striking features. There are no easier shrubs to handle and control than these and there is practically no limit to the number of situations where they seem to suit as nothing else does.

Wild Roses
Rosa species

A boulder-dotted pasture in the dewy freshness of early morning, a herd of patient cattle browsing among the hummocks, a bit of marsh with

ARROW-WOOD (*Viburnum dentatum*)
(*See page 77*)

THE PLUM-LEAVED HAW (*Viburnum prunifolium*)
(*See page 77*)

red-wing blackbirds swaying on the cat tails, an old snake fence with elders and thorn apples in the corners, a bordering forest half-veiled in fleecy mist—these are the surroundings in which the wild rose must be sought and seen, in order to come to a full realization of its exquisite beauty. According to the botanists, there are half a dozen species of wild roses, but as their flowers are alike in form, color and fragrance, and there are no material differences in height or foliage, it seems unnecessary for the purposes of this book, to consider any of the finer distinctions. They are well fitted for many kinds of naturalistic plantings, but should be used with taste and discernment. The safest plan is to imitate Nature, both as to location and arrangement; otherwise the results will be inharmonious and unsatisfactory. The bushes are easily moved from the wild, or good plants may be purchased. They need little cultural attention.

The climbing rose (*Rosa setigera*), of our western prairies, makes a most satisfactory retaining cover for barren slopes and steep banks with a tendency to become gullied after heavy rains. Its chief merits are its broad, clean, healthy foliage, its immunity from insect attacks and disease, and the conspicuous charm of its immense clusters of

deep, rose-colored flowers. If planted at intervals of twelve feet or so, with a pocket of good soil about each root, it soon forms a dense mat of surprisingly beautiful appearance.

Thoreau called the wild rose, the Pride of June, and in summing up its attractions, mentioned its rich color and form, the rare beauty of its bud and its fine perfume. He, like the botanists, was bewildered at its almost innumerable varieties, but this did not lessen his intimate regard for it. "I bring home the buds ready to expand," he wrote, "put them into a pitcher of water, and the next morning they open and fill my chamber with fragrance."

The Elders
Sambucus canadensis
Sambucus racemosa

I could never be entirely satisfied with a country place that lacked an old-fashioned rail fence. I would always feel that one ought to be zigzagging along the borders of some field or pasture if only to provide a fitting home for the purple-berried elder. For in no other situation does this handsome and friendly shrub seem so entirely happy or show to such fine advantage. It sets up housekeeping in every angle and extends a gracious hospitality to all who come that way. The raspberries and blackberries, the choke cherries and thorn apples are its usual and permanent guests.

The weather-beaten cedar rails, which serve as walls, are festooned with the wild clematis and the climbing bittersweet. The floor is carpeted with the milkweed, the golden-rod and the hay-scented fern. Here, in the midst of plenty, the birds love to build their nests; here the bees suck and the butterflies hover in the sunshine. Here the visitor is greeted with a glorious medley of fragrance and color and melody all summer long.

Those who have lived in and really know and love the country, appreciate the elder at its true value. They are enthusiastic admirers of its bold foliage, its masses of cream-white, fragrant blossoms, and its handsome clusters of purple fruit. Others affect to ignore or despise it because it is "common," and yet many of them will buy, plant and rave over the imported, so-called, "*golden* elder," an ugly, sickly-colored thing that is a disgrace to the elder family and should not be tolerated on American grounds.

The purple-berried elder is known botanically and in the nursery trade as *Sambucus canadensis*. It blooms during June and July. Its cultural requirements are the simplest imaginable. A single stalk uprooted by hand, and planted anywhere, will make a good-sized bush in a year or two. It is appropriate for planting in a woodland border, or along the

roadside, or on the far bank of a stream, but I like it best in close association with the old rail fence.

We have another elder, the red-berried kind (*Sambucus racemosa*), that grows wild in dry, rocky woods but will thrive in practically any location. It closely resembles the purple-berried species in habit and foliage, but the flowers and fruit are different. The flower clusters are cone-shaped, appearing in April and May along with the pink azalea and the shadbush; and the berries are a bright, glowing, scarlet-red. It makes a fine, symmetrical bush and is most effective planted in masses, in combination with *S. canadensis*. For the latter is in bloom when *S. racemosa* is in fruit and thus a long continued display is insured.

Meadowsweet *Spiræa latifolia*

This common shrub of our low meadows and swampy lands, is surprisingly good looking, when planted where conditions are favorable for its unhampered development. It then assumes a pleasing symmetry of form, which displays to advantage its dense foliage of varying shades of green, its red-brown stems, and its branching spikes of clustered pinkish flowers. With two exceptions, I consider it superior to any of the civilized spireas as a lawn shrubbery plant. I do not, however,

advocate its use in such society, much preferring to see it growing in masses as it does naturally, in boggy places, where its associates are the steeplebush, the shrubby cinquefoil, the meadow rue, the monkey flower and, not infrequently, the scented purple-fringed orchis. The meadowsweet is a very tractable shrub, easily transplanted and responsive to good treatment. It may be taken from the wild or purchased from growers.

The Steeplebush
Spiræa tomentosa

The steeplebush and the meadowsweet are close relatives, with similar tastes as to soil and moisture, and with a marked family resemblance. The chief points of distinction are the spire-like clusters of purple-pink bloom which the steeplebush displays, and the downy white under-covering of its leaves, noticeable at a long distance on a breezy day. It is as easily handled as the meadowsweet and should be planted with the latter and given the same treatment as regards arrangement and location.

Shrubby Cinquefoil
Potentilla fruticosa

In some sections this notably handsome little shrub makes a nuisance of itself by taking entire possession of fallow fields and temporarily neglected pastures. In the Berkshires, where it has done this very thing and is despised accordingly, it is known as

"hardhack," a name usually given to the steeplebush (*Spiræa tomentosa*). I infer that the innumerable hard hacks necessary to grub it out suggested the nickname. Fortunately, it is rather unusual for the shrubby cinquefoil when cultivated, to show any propensity to break out of bounds, and, as a rule, its bright golden blossoms, which contrast so beautifully with its neat five-parted, sage-green foliage, may be enjoyed during the summer months without apprehension. While its preferred habitat seems to be the moist and rocky margins of swamps, it adapts itself to any fairly sunny situation in which it may be placed. And what is more, it invariably looks as if it belongs there. So, in naturalistic plantings, it may be used, preferably in good sized clumps, wherever a showy underplanting, or ground cover is desired, if not in dense shade. It is as easily handled and established as a geranium and may be obtained from dealers, or from neighboring pastures.

Flowering Raspberry *Rubus odoratus*

Where the summer shade is darkest the showy blossoms of the flowering raspberry display their varying tints as though striving to light up the pervading gloom. I am surprised at the tendency of some recognized authorities to call the color of these flowers magenta.

FLOWERING RASPBERRY (*Rubus odoratus*)
Photo by C. R. Shoemaker (*See page 86*)

The lower leaves of the flowering raspberry often measure ten to twelve inches across and make fine drinking cups for thirsty explorers of the woodland.

SHRUB YELLOW ROOT (*Zanthorhiza apiifolia*)
(*See page 89*)

As a dwarf undershrub to cover the ground under trees or as an edging for shrubberies this neatly habited member of the buttercup family and its only shrub, has no superior.

It is true that when the petals are faded and just about to fall the color is a rather muddy purplish-pink, like that of an old American beauty rose, but at other stages, it ranges from a rich crimson on opening to a deep clear rose, or, in some cases, a pale pink—always with a discernible bluish tone, but never showing, to my eyes at least, the slightest tendency to magenta. The flowering raspberry, away from the tangles of its natural haunts, becomes a handsome shrub of medium height, with enormous maple-like leaves and an abundance of bloom. The flowers are followed quickly by raspberry-like fruit that looks tempting but is dry and insipid to the taste. Its most appropriate use in naturalistic planting is in masses on the slopes of a rocky, shaded hill, on the forest floor as a cover for some extensive stony area, or as a factor of a defining border for a shady woodland glade. It is sometimes, in rocky places, quite a difficult task to dig specimens with enough roots to insure growth. Strong, well rooted plants can, however, be purchased of many growers and these are sure to succeed.

Yellowroot
Zanthorhiza apiifolia

The yellowroot is the only shrubby member of the crowfoot, or buttercup family. Its habit is very dwarf and spreading and its foliage

is handsomely and deeply cut, giving it an air of distinctive lightness and grace. While its clusters of tiny, brownish flowers in early spring are not conspicuously showy, the leaves in autumn make ample amends by the brilliancy of their tints of purple and gold. The yellowroot will grow successfully in shade or sun, in poor soil or rich, moist or dry. It even thrives under shallow rooted trees, where otherwise the ground would be absolutely barren, and makes a fine appearance either as a low edging for shrubbery groups, or in masses by itself. Plants may be purchased of dealers at moderate prices and in any quantity.

The Pinxter Flower or Pink Azalea
Rhododendron nudiflorum

CHAPTER VI

Ornamental Shrubs Belonging to the Heath Family

The heaths, or *Ericaceæ*, are considered as excelling all other shrubs in the remarkable beauty of their flowers and foliage. Here belong the azaleas, the rhododendrons, the mountain laurel, the blueberries and huckleberries, and many other ornamental and useful natives of our woods and fields. Many of them, like the rhododendrons and laurel, have persistent foliage and are called broad-leaved evergreens. These are attractive at all seasons and are invaluable for winter effects.

As all the members of this important and interesting family are shallow rooted, and as, without exception, they show a marked preference for situations where the upper layer of soil is decidedly acid, it is advantageous from a cultural standpoint, to give them a chapter to themselves.

Permanent success in growing any shrub of the heather tribe cannot be expected unless particular care is taken to provide the

right kind of soil, proper mulching and thorough drainage. The soil, to the depth of a foot or more, should be light, rich and porous, composed largely of humus or peat, and without a suspicion of lime. The surface mold under pines, hemlocks or oaks is ideal for these plants; and this may be mixed equally with ordinary garden loam that shows no alkaline reaction. The acidity of subacid or moderately acid soil may be intensified by occasional waterings with a solution of commercial tannic acid—about one part acid to fifty of soft water. A permanent mulch of old pine needles, or half-decomposed oak leaves, should cover the ground under the plants to a depth of two inches. This is essential both to maintain the acidity and to insure a practically uniform degree of moisture. If the drainage is not naturally good, it should be made so by first excavating the area to be planted to a depth of two feet and putting a foot or so of pebbles, coarse gravel or crushed stone (not limestone) in the bottom. The top soil, composed as directed, may then be added. Even in limestone regions, rhododendrons, laurel and azaleas can be grown successfully in beds or places prepared in this way, if they are further protected by a surrounding ridge of humus from the wash or overflow of alkaline

WHITE SPRUCE AS AN ISOLATED SPECIMEN

(*See page 31*)

OSTRICH FERNS ON GUARD AGAINST WEEDS

water after rains. (See chapter on soils, page 12).

As regards exposure, the undoubted preference of most of the broad-leaved evergreens is for shade, at least in some degree, although they will often tolerate sunny positions and even do fairly well there if other conditions are congenial. The color of the flowers, however, is usually better and that of the foliage richer and darker, if they are protected from the direct rays of the sun for the greater part of the day. Many deciduous species, on the other hand, actually revel in the sunshine—the pink azalea, the huckleberries and most of the blueberries, for example—and there are some in both sections that appear indifferent and seem entirely content in either shade or sun. All of the broad-leaved evergreens should be sheltered from the strong winds of winter.

Rose Bay or Great Laurel *Rhododendron maximum*

This robust shrub is the giant of the family, attaining a height of thirty feet or more in the Carolina mountains, where it lines the streams and covers swamps and moist hillsides with impenetrable tangles of twisted stems and dense, leathery foliage. Farther north it is of more modest proportions and rarely exceeds six feet in height at maturity. In early summer, when its masses of rosy blossoms are in evidence, it is an

object of surpassing beauty and, if planted with proper regard for natural and harmonious effect, may be made an attractive feature of many superb landscape pictures. Its most fitting arrangement is in irregular clumps on a half-shaded slope which rises from the margin of some pond or stream, although there can be no criticism of its use in a border planting along a woodland drive, or as a cover for the sides of a deep ravine, provided it is always kept at a discreet distance. It is too coarsely habited, too scantily clothed with foliage underneath, for close inspection and should always have an underplanting of *Leucothöe catesbæi*, *Andromeda floribunda*, *Taxus canadensis*, or other compact, low-growing evergreen, to hide its scrawny legs.

Mountain Rose Bay
Rhododendron catawbiense

The leaves of this species are much smaller than those of *R. maximum* and its habit is neater and more compact. The flowers, which open in May and early June, are lilac-purple, or rosy-lilac in color, and are borne in profusion. It is a strikingly handsome shrub at all seasons, but for the sake of color harmony, should be kept away from plants blooming at the same time and having blue, pink or red flowers. *R. catawbiense* has been used by foreign hybridizers for many years as one of the parents of the imported rhodo-

THE RARE CAROLINA RHODODENDRON
Rhododendron carolinianum

The Lovely Sea-shell Azalea
Rhododendron Vaseyi

dendrons, so frequently used for lawn planting in this country.

Carolina Rhododendron
Rhododendron carolinianum

A most desirable rhododendron for wild plantings of any description is *R. carolinianum*, a native of the higher Blue Ridge Mountains that is as rare as it is charming. I consider it the very finest of the broad-leaved evergreens. It forms a compact, rounded shrub that grows naturally from four to six feet high, and is of equal diameter when well developed. Its dark green leaves are even smaller than those of R. *catawbiense*, giving it a light, airy aspect that is much more pleasing than the rather sombre heaviness of the other two species. The flowers range from pale to a deep pink as clear and pure as that of the wild rose, and are borne in such abundance that they completely cover the bush. On one three-foot specimen I counted 267 blossoms! They appear very early, before new growth starts, and are therefore never hidden. A finer plant for the borders of woodland walks and drives, or as an undershrub anywhere, cannot be imagined.

Mountain Laurel
Kalmia latifolia

No native flowering plant is more generally known or more universally admired than the mountain laurel. Yet it is treated with little respect and less considera-

tion. Its lovely blossoms and handsome evergreen foliage are considered legitimate prey by vandals of all ages, sexes and nationalities, who leave behind them only mutilated stems and torn-up roots, whenever they visit its natural hillside haunts. The urgent appeals of the wild-flower preservation societies for the protection of the laurel should be heeded by every admirer of American plants and American scenery; and all those who can give it safe harbor and a suitable location should establish colonies and encourage it to increase and multiply on their premises. Plants exceeding one foot in height should never be taken from the wild; and, except in the most remote and wildest sections, even the little seedlings, which transplant readily, should be left undisturbed, in the hope that they may survive the depredations of the wild-flower huns. The mountain laurel is easily propagated, therefore nursery-grown plants can be purchased at very reasonable prices. These are always of better habit than plants taken from the wild and much more floriferous. While the laurel is seemingly indifferent as regards location if the soil is moist, and of moderate acidity (sub-acid), it has a strong liking for rocks and rocky hillsides, where it always shows to best advantage and makes the finest

displays of its rosy blooms. It is also an excellent covering for the woodland floor, particularly under cone-bearing evergreens. It is improved in form by judicious cutting back and may be kept at any height desired.

Sheep-laurel
Kalmia angustifolia

The sheep-laurel or lamb-kill is a miniature of the mountain laurel, in whose company it is frequently found growing on moist, rocky slopes. Its preferred habitat, however, is boggy pastures and open swamps, where it takes possession of hummocks and knolls that have sufficient elevation to keep its roots above the water level. It evidently requires acid soil and abundant moisture, but must have good drainage as well. It is smaller in all its parts than the mountain laurel, has narrower leaves, and flowers less than half the size, but of a deeper pink, sometimes verging on crimson. The stems are terminated by tufts of erect new leaves, beneath which, in June, the encircling flower clusters appear. Below the blossoms the leaves droop. The place for this comely little shrub is in the higher portions of the bog garden, or as a feature of a meadow planting. It is evergreen and most effective in masses.

The handsome little pale laurel is similar to and even smaller than the sheep-laurel.

Pale Laurel *Kalmia polifolia*

The edges of its narrow leaves are rolled back and are conspicuously white-green underneath. The flowers are fewer to the cluster and terminate the stems. They open a bright, rosy lilac, or sometimes a crimson-pink, but soon fade to a paler hue. The pale laurel is rarely over eighteen inches high, blooms in April and May and, like the sheep-laurel, prefers to make its home in boggy or swampy places. It is an appropriate companion for the sheep-laurel and should be treated similarly as regards location and culture.

Mountain Fetter Bush *Andromeda floribunda*

As an under-shrub for group or border plantings of rhododendrons or mountain laurel, nothing can equal this andromeda. Its rounded form and its particularly dense and shining evergreen foliage not only serve to conceal the ragged stems and scant lower clothing of the bushes in its rear, but its racemes of white or pinkish bell-shaped blossoms are distinctly ornamental. The flower buds have the unique habit of maturing in autumn and from then until early spring seem always just on the point of bursting into bloom, a characteristic that is very attractive during the winter months. *Andromeda floribunda* comes from the higher mountains of Virginia and North Carolina.

Mountain Laurel by the Path
Kalmia latifolia

THE GORGEOUS FLAME AZALEA
Rhododendron calendulaceum

Nurserymen have found that if cut back to the ground when first set out, the plants will send up twelve or fifteen stems apiece and, in the course of two or three years, will develop into sturdy bushes two to three feet high that are perfect balls of living green.

Andromeda polifolia, the wild rosemary, is a beautiful low species of almost creeping habit, that is indigenous to cold bogs in the extreme northern part of our range. It has very narrow, handsome leaves and produces its dainty pink or flesh-colored, globular blossoms in small terminal clusters during May and June. It is a fine companion plant for the two bog-loving laurels and adapts itself readily to situations for which they are suited.

Catesby's Leucothoë
Leucothoë catesbæi

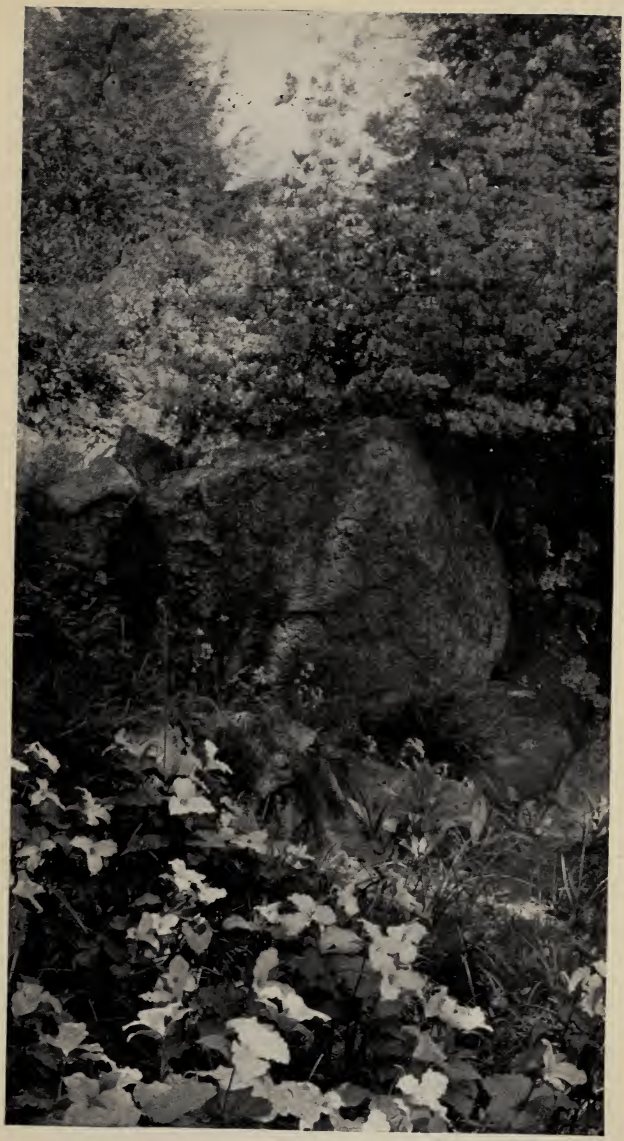
Another strikingly handsome broad-leaved evergreen from the southern Alleghanies, that resembles in some respects *Andromeda floribunda* and is equally hardy and amenable to cultivation. Harriet L. Keeler, in *Our Northern Shrubs*, gives this excellent description of the winter aspect of the *leucothoë:* "The flower buds are developed in autumn in the axils of the persistent leaves of the year and look like cylindric cones about half an inch long, with close imbricate scales. As the weather grows cold these

scales turn a deep red, the same color suffusing in a slighter degree the ends of the zigzag stems; at the same time, the upper leaves with their petioles often color as richly as the flower buds. The lower leaves for the most part retain their deep, lustrous green color, and the contrast between the upper and lower parts of the plant only adds to its beauty."

The leaves of *Leucothoë catesbœi* are thick, leathery and distinctly sharp-pointed. The flower spikes, which are not unlike those of the lily-of-the-valley, produce their white or pink waxy bells in April. While its foliage is not so dense, nor its habit so compact, this shrub can be used effectively in wild plantings in the same manner as the *Andromeda* or in clumps by itself. It grows to a height of three to five feet and is the better for occasional pruning, if judiciously done.

Smooth or Tree Azalea
Rhododendron arborescens

This is a tall, handsome shrub growing from ten to fifteen feet high in its native haunts on the high slopes of the Alleghanies. In more northerly sections it does not exceed half that height and is easily kept within desired bounds by cutting it back. Its large pure white, or rose tinted flowers appear in mid-June and are very fragrant. Their beauty is greatly enhanced by the bright



AZALEAS AND TRILLIUMS IN A ROCK GARDEN

FLAME AZALEA (*Rhododendron calendulaceum*)

Photo by C. R. Shoemaker (*See page 105*)

"One of the great sights of this continent for the lover of flowers is the slopes of the southern Alleghanies in June, when ablaze with the great flame-colored masses of this splendid plant."

–Prof. C. S. Sargent.

scarlet projecting stamens. The oval, pointed leaves, shining green above and much paler beneath, are fully developed before the flowers open, and become fragrant with age. The smooth azalea is distinctively a woodland species and makes a charming companion for the flame azalea (*R. calendulaceum*) in the planting of borders for forest walks and drives and in other situations where its color will show to advantage.

Flame Azalea
Rhododendron calendulaceum

There is no more gorgeous sight in the world than a mountain slope in early June, ablaze with the flame-colored blooms of this splendid shrub. Even the most ardent admirers of imported azalea hybrids admit that it is not inferior to the best of them. Its flowers open before those of the smooth azalea and vary in color from bright yellow to orange-pinks and reds that fully justify its popular name. The dark green foliage, which is well grown before the flowers appear, adds much to their glowing beauty. It is a medium sized shrub of rather slow growth and improves greatly in appearance under good treatment, either in shaded locations or in the open. While the most striking effects are produced by mass planting, it is also exceedingly handsome used singly or in small groups, and is specially fine as a companion for the smooth azalea.

Pinxter Flower
Rhododendron nudiflorum

Hardly any two botanical writers agree as to the preferred habitat of this common but lovely azalea. Gray assigns it to open woods and swamps. Keeler somewhat vaguely says it is "variable" in choice of location. The real truth is that it is absolutely indifferent as regards situation, exposure and moisture as long as the soil is sufficiently acid. It is therefore one of the most adaptable of all flowering shrubs and can be used successfully and with strikingly beautiful effect, in shaded woodland or sunny meadow, on dry hills and banks or in bogs and swamps; in poor, sandy or gravelly ground, or in rich, porous mold; provided only and always that a high degree of soil acidity prevails. It naturally grows most luxuriantly in fertile places, frequently reaching a height of five to six feet in rich woods, while in open sterile locations it is usually only two feet high, or less. The bright pink, pleasantly fragrant flowers expand before the leaves in late April and early May. Its popular name, "Pinxter flower," was given because it is in bloom on Whitsunday, the Dutch for which is *Pingster*. It is also known locally as the wild honeysuckle or the swamp pink, and, more generally, as merely the pink azalea.

SWAMP HONEYSUCKLE AND CINNAMON FERN

Photo by C. R. Shoemaker (*See page 109*)

During July and August our northern swamps are permeated with the delicious fragrance of the waxy-white, or pale pink blossoms of the swamp honeysuckle, or white azalea.

DWARF HUCKLEBERRY (*Gaylussacia dumosa*)
Photo by C. R. Shoemaker (*See page 113*)

BOX HUCKLEBERRY (*Gaylussacia brachycera*)
Photo by C. R. Shoemaker (*See page 113*)

Sea Shell Azalea *Rhododendron vaseyi*

The charming pink blossoms of this rare and beautiful species from the high valleys of the Blue Ridge, open in compact clusters early in May, before the leaves appear. It is a medium-sized shrub of picturesque habit, with slender stems that develop flowers when less than a foot high. The pure, perfect pink of the petals is comparable only to that of a newly opened wild rose and the autumn color of its foliage is gay with brilliant tints. *Rhododendron vaseyi* may be obtained of a few nurserymen who specialize in the growing of native plants and is well worth the moderate price charged. It thrives best in rather moist soil and is happiest in close proximity to water, but can be grown with excellent results in any situation where the soil is acid and never becomes actually dry.

Swamp Honeysuckle *Rhododendron viscosum*

Last of the azaleas to flower, this denizen of the swamps and moist hillsides does not open its waxy white, intensely fragrant blossoms until July, but it atones for this tardiness by continuing to display them abundantly until the middle or latter part of August. It is a neat looking shrub of medium size, with yellow-green leaves in tufts at the ends of the hairy and somewhat

sticky branchlets, and is excellent in any suitable location where midsummer bloom is desired, or as an undershrub for rhododendrons or any of the cone-bearing evergreens.

Rhodora
Rhododendron canadense

This ornamental little bush frequently covers broad areas of swampy land near the coast with sheets of rosy-purple blossoms. Higginson writes regarding its manner of literally bursting into flower, "On the margin of some quiet swamp a myriad of bare twigs seem suddenly overspread with purple butterflies and we know that the rhodora is in bloom. . . . There is nothing else in which the change from nakedness to beauty is so sudden." The rhodora should be planted in masses for most pleasing effects and kept away from plants whose flowers do not harmonize with it. *Rhododendron catawbiense* is an entirely acceptable neighbor from a color standpoint, as are any of the pale yellow, or white flowering plants which bloom in early spring.

Black Huckleberry
Gaylussacia baccata

This species, generally listed in catalogs as *Gaylussacia resinosa*, is the most ornamental bush of the huckleberry tribe and bears the sweetest and best flavored berries. It is abundant in rocky woods and thickets throughout the north. The pale-green, shin-

FALSE SPIKENARD (*Smilacina racemosa*)

GREAT SOLOMON'S SEAL (*Polygonatum commutatum*)

ing leaves, which turn in autumn to glowing tints of orange and crimson, are densely arranged on the numerous brown branches; and amongst them in May and June, appear the yellowish bell-shaped flowers, tinged with green and crimson-pink. The fruit is black or purple-black, juicy and agreeable to the taste, but seedy like all the huckleberries. As a neat and attractive ground cover in open woods, the black huckleberry meets every requirement, particularly when interspersed with clumps of the dicksonia or the spinulose shield fern. Its usual height is from one to three feet. Torrey said of this plant, "The huckleberry grows a second crop—a crop of color. It is twice blessed—it blesses him that eats and him that sees." Other attractive species of huckleberry are the dwarf huckleberry (*Gaylussacia dumosa*) and the box-huckleberry (*Gaylussacia brachycera*). The latter is practically evergreen and makes a fine ground cover.

Low Sweet Blueberry
Vaccinium pennsylvanicum

This is the comely, spreading blueberry of dry, sandy and rocky places, especially on the summits of high hills and mountains. The white flower bells appear in profusion during May and June and are followed in July and August by the delicious, sky-blue berries. The bushes, usually not over eighteen

inches high, are of dense branching habit and make a fine carpet for sunny areas where the soil is poor. They are particularly attractive during the fruiting stage when the combination of immature and ripe berries displays a variety of color ranging from pale greens to pinks, reddish purples and blues. There is also another even more gorgeous blaze of color in autumn, when the foliage turns to glowing scarlets and crimsons.

Dwarf Late Blueberry *Vaccinium vacillans*

This species, while delighting in any dry soil, is very partial to the shaded edges of thickets and to open woods. It is easily distinguished by its yellow-green stems, which grow from one to three feet high. The flowers and fruit are borne at the extremities of the numerous branches, both in bountiful profusion. Its purplish blossoms appear in May but the berries are not ripe until late July and August, lasting long after those of *V. pennsylvanicum* have withered away. The foliage turns crimson in autumn.

High-bush Blueberry *Vaccinium corymbosum*

The following description of the high-bush blueberry written by Mr. Jackson Dawson, of the Arnold Arboretum, is both informative regarding this exceedingly ornamental shrub and suggestive of its tasteful use in natural plantings: "*Vaccinium corym-*

bosum forms handsome clumps of shrubbery from four to ten feet high in deep swamps and moist woods, but seldom reaches more than four feet in open pastures. The young branches are usually yellowish green, turning to a light gray when old or much exposed, while the bark on old stems becomes rough and peels off in shreds. The flowers are pretty white bells, borne at the extremity of the branches of the previous year's growth. They appear in May and early June and the fruit is ripe from August to late September. The latter is variable in shape, size, flavor and color."

The high-bush blueberry is easily established, and will flower and fruit abundantly if planted in moist, mediacid soil, in sections where it freezes during the winter. It cannot be expected to thrive "in ordinary garden soil" as some dealers advertise, nor in the gulf states. The autumn coloring of this blueberry is a particularly brilliant scarlet-crimson and the flaming leaves do not fall until well along in November, sometimes persisting until Thanksgiving day. The berries are equaled in flavor and size only by those of *Vaccinium pennsylvanicum.*

CHAPTER VII

Conspicuous Herbaceous Wild Flowers

The lists in this chapter have been carefully made up so as to make it easy to select suitable and beautiful species for any purpose. They include 184 of the most attractive perennial kinds, all of which are perfectly hardy and easy to grow if the brief, but sufficient directions given for their cultural treatment are carefully followed.

The plants are divided into groups according to soil acidity requirements, because with many species, as has been shown in the chapter on soils, the degree of acidity in the soil in which they are planted is the deciding factor in their successful growth.

The largest number will be found in the group classed as indifferent, which means that they will thrive in any kind of soil of suitable texture, regardless of its degree of acidity or alkalinity. This group fortunately contains many of the most beautiful kinds, which may in consequence be used as companion plants to their rarer and more fastidious sisters of other groups, in the composition

SPIDERWORT (*Tradescantia virginiana*)
Photo by E. L. Crandall (*See page 120*)

WAKE ROBIN (*Trillium erectum*)
Photo by E. L. Crandall (*See page 123*)

PICKEREL WEED ON A PICKEREL POND

Photo by E. L. Crandall

(See page 120)

of innumerable lovely combinations. The next largest group comprises species that grow naturally in circumneutral soils and will not tolerate acidity in excess of ten. Then comes the still smaller group of subacid plants and finally those which must be given intensely acid or mediacid soil—few in number, but including some of the choicest and most charming wild flowers.

The nomenclature adopted, both as to common, or popular, and botanical names, is that used by Mr. F. Schuyler Mathews in his *Field Book of American Wild Flowers*. In most cases the names are the same as those in Gray's *New Manual of Botany*, 7th Edition.

As this book is not intended to be used as a guide, or means of identification, the descriptive matter is confined, in the order stated, to the average height of each plant, its blooming season, *dominant* color of flower, color of fruit if conspicuous, preferred habitat and such further information as should prove helpful in its culture. If more complete data is desired, it will be found in the Mathews book.

Plants that are easy to establish but should *not* be collected from the woods and fields because of their threatened extermination, are indicated by the word (BUY), and can be obtained from nurserymen.

Kinds requiring special cultural attention and protection are indicated by the word "Sanctuary" and should neither be bought nor collected, unless provision has been made to give them the treatment and care prescribed in the chapter on "Wild Flower Sanctuaries." Any of the others may be collected without jeopardizing the existence of the species, or may (most of them) be purchased by those who cannot find time or opportunity to obtain them from the wilds.

GROUP NO. 1. WILD FLOWERS THAT ARE INDIFFERENT AS REGARDS SOIL ACIDITY

Spiderwort or Job's Tears *Tradescantia virginiana* — 12–15 inches. May–August. Ultramarine blue. Moist ground. Native from Maryland, south and west to Missouri. A favorite of the old-fashioned garden.

Pickerel Weed *Pontederia cordata* — 18–30 inches. June–September. Violet-blue. Shallows of lakes, ponds and sluggish streams everywhere. Indispensable in the water garden.

False Spikenard *Smilacina racemosa* — (Sanctuary) (BUY) 24–30 inches. White. May. Berries white, speckled brown, changing to dull translucent red. Moist situations. Common, but needs protection

LARGER BLUE FLAG (*Iris versicolor*)
Photo by C. R. Shoemaker (*See page 124*)

LARGE TWAYBLADE (*Liparis liliifolia*)
Photo by E. L. Crandall (*See page 124*)

LADIES' TRESSES (*Spiranthes cernua*)
Photo by C. R. Shoemaker (*See page 123*)

TALL YELLOW LADY'S SLIPPER (*Cypripedium pubescens*)
Photo by H. S. Barber (*See page 123*)

as it is pulled up by the thousand for sale on the streets and in flower shops. A beautiful plant in any situation: may be used singly or in clumps. Is also known as False Solomon's Seal.

Lily of the Valley *Convallaria majalis* — 6–8 inches. White. Fragrant. May–June. Berries red, but infrequent. Native to the higher Alleghanies, Virginia to Georgia. Does equally well in sun or shade, if in rich, fairly moist soil. Planting in different exposures lengthens season of bloom. Makes large masses and is an excellent ground cover.

Solomon's Seal *Polygonatum biflorum* — 18–30 inches. Greenish white. April–June. Berries blue-black. In thickets and on dryish wooded slopes everywhere. Extremely graceful and decorative when used singly or in moderate sized clumps. The species *P. commutatum* is much taller and more robust and is found in meadows and on river banks.

Wake-robin *Trillium erectum* — 7–12 inches. Rather dull purplish-red, or maroon. April–May. Rich moist woodlands. Common. Plant tubers four to six inches deep. Attractive in combination with the white large flowering trillium. Also called the bath flower and simply the red trillium.

Larger Blue Flag
Iris versicolor

15–30 inches. Violet-blue. May–June. Common on margins of brooks and ponds and in swamps. Varies in color and improves perceptibly in cultivation. Select specimens of pleasing color for transplanting. Not particular as to exposure.

Crested Iris
Iris cristata

(Sanctuary) (BUY) 3–6 inches. Violet, with orange-yellow crest. April–May. Common on hillsides and along streams from Maryland south to Georgia and west to the Mississippi. A very dainty flower that takes kindly to cultivation in most any situation. Set plants ten to twelve inches apart and they will soon spread and form irregular mats of considerable size.

Large Twayblade
Liparis liliifolia

4–5 inches. Madder purple. June–July. On dry shaded hillsides, never plentiful. Has bulbous root and transplants easily. An interesting orchid that does well in any woodland planting, and, in clumps of six to twelve, is exceedingly attractive.

Ladies' Tresses
Spiranthes cernua

(Sanctuary) (BUY) 6–12 inches. Creamy white and very fragrant. July–August. A not uncommon orchid found in moist grassy places. It should be planted in similar situations in clumps.

VIRGIN'S BOWER (*Clematis virginiana*)
(*See page 128*)

By rubbing any side of the stem of a young clematis leaf with a twig Darwin found that the leaf would, in a few minutes, bend to that side, but would return to its former position if it found nothing on which to hook itself.

ROCKY MOUNTAIN COLUMBINE (*Aquilegia cærulea*)
Photo by A. S. Hitchcock
(*See page 128*)

Purple Fringed Orchis *Habenaria psycodes* (Sanctuary) (BUY) 1–3 feet. Lilac-pink, fragrant. July–August. Frequent in swampy places and wet woods. Not difficult to establish in similar localities.

Yellow Lady's Slipper *Cypripedium pubescens* or *C. parviflorum* (Sanctuary) (BUY) 12–18 inches. Yellow. May–June. Apparently prefers moist, rich, *stony* soil, in deciduous woods. One of the best native orchids for cultivation, as few plants fail to thrive when properly set in congenial surroundings.

Dutchman's Pipe *Aristolochia macrophylla* (BUY) A vine, 10–25 feet high. Dull green, purple-brown. May–June. A very dense and attractive vine, growing in rich damp woods from southern Pennsylvania, south and west. Responds readily to cultivation.

Starry Campion *Silene stellata* 2–3 feet. White. June–August. A handsome plant, common on well-drained wooded slopes throughout our range. Transplants readily.

Yellow Pond Lily or Spatter-dock *Nymphæa advena* Golden-yellow. May–September. Very common in stagnant water everywhere, but worth using in good-sized water gardens. There is a smaller form, *minus*, which is also attractive.

Virgin's Bower *Clematis virginiana* (BUY) A very beautiful vine about 12 feet long. Greenish white. Seed vessels covered with fluffy gray plumes. July–August. Frequent on roadsides and river banks, climbing over bushes and fences, for which purpose it cannot be surpassed. Easy to establish.

Rocky Mountain Columbine *Aquilegia cærulea* (BUY) 18–30 inches. Blue and white. May–June. Entirely appropriate for wild gardens, in company with our Eastern species, as is also the western yellow columbine, *Aquilegia chrysantha.*

Canada Anemone *Anemone canadensis* 1–2 feet. White. May–August. Common in low moist ground everywhere. Excellent for the wild garden. Offered by some growers as *A. pennsylvanica.*

Rue Anemone *Anemonella thalictroides* 5–9 inches. White, or pink-tinged. March–May. Common everywhere in thin moist woodlands, usually in company with the wood anemone (*A. quinquefolia*). Very attractive planted in masses and easily grown.

Tall Meadow Rue *Thalictrum polygamum* 3–10 feet. White. July–September. Common in wet meadows everywhere. Transplants easily and thrives under ordinary conditions in practically any soil or any exposure. Sometimes offered as *Thalictrum cornuti.*

The Lovely Crested Iris
Iris cristata

The Narrow Blue Flag
Iris prismatica

THE BRILLIANT MARSH MARIGOLD
Caltha palustris

Black Snakeroot *Cimicifuga racemosa* — 3–8 feet. White. June–July. Frequent in deep moist woods. Easy to transplant and is both useful and striking as an under planting in woodlands, if at some distance from walks or drives.

Red Baneberry *Actæa rubra.* (BUY) 1–2 feet. White. Berries bright red, at the ends of slender stems. April–June. Frequent in open well-drained woods, of easy culture and particularly handsome in combination with such ferns as the maidenhair and spinulose shield fern. The white baneberry, *Actæa alba*, is almost exactly similar, except that the berries are shiny china white, with red stems.

May Apple *Podophyllum peltatum* (BUY) 12–18 inches. White. Late April–May. Frequent locally in moist shaded situations. An attractive, easily-grown plant in damp, rich soil, any location.

Bloodroot *Sanguinaria canadensis* 10 inches. White. April–May. Common in rich, stony ground on the borders of woods and copses and along shaded roadsides. Transplants readily at any season. Most attractive in good sized clumps.

Foam-flower *Tiarella cordifolia* (Sanctuary) (BUY) 6–10 inches. White, with orange anthers. May–June. Frequent in rich moist woods, where it grows in

attractive masses. It is, perhaps, the most beautiful native ground cover, responds readily to cultivation and, once established, increases rapidly.

Alumroot *Heuchera americana* — 18–24 inches. Whitish-green. May–July. A common but handsome plant of easy cultivation, found in dryish rocky woodlands. Valuable for its beautifully mottled foliage. The flowers are inconspicuous.

Queen-of-the-Prairie *Filipendula rubra* — 2–5 feet. Deep pink. June–July. Found in moist, open situations from Pennsylvania south to Georgia and west to the Mississippi. Fine for meadow planting and on the borders of the bog garden.

Goat's Beard *Aruncus sylvester* — 3–6 feet. Buff-white. May–July. Frequent in rich woods, New York south to Georgia and west to Missouri. Attractive when planted with the preceding.

Wild Strawberry *Fragaria virginiana* — 3–6 inches. White. Fruit scarlet. April–June. Common in fields Should be in every meadow. *Fragaria vesca*, the wild wood strawberry, is particularly suited for the shady rock garden, or as a ground cover in any woodland planting. Its fruits are cone-shaped and of delicious flavor.

MAY APPLE (*Podophyllum peltatum*)
Photo by E. L. Crandall (*See page 129*)

BLOODROOT (*Sanguinaria canadensis*)
Photo by E. L. Crandall (*See page 129*)

WOOD STRAWBERRY (*Fragaria vesca*)
Photo by E. L. Crandall (*See page 130*)

BLUE LUPINE (*Lupinus perennis*)
Photo by C. R. Shoemaker (*See page 133*)

Blue Lupin *Lupinus perennis* 1–2 feet. Violet-blue, rarely pink or white. May–June. Common in barren fields. An attractive plant, succeeding well in poor, sandy soil, in the sun.

Tick Trefoil *Desmodium canadense* 2–5 feet. Pink. July–September. A showy plant, with neat foliage and handsome flowers, found on the borders of copses and river banks. Easy to grow in similar situations.

Wild Geranium *Geranium maculatum* 12–18 inches. Magenta to pink. May–July. Common in thin woods and adjacent fields and is easily transplanted. Choose plants for color.

Violet Wood Sorrel *Oxalis violacea* 4–6 inches. Rosy purple. May–June. Frequent locally in rocky soil in both sun and shade. An excellent companion for the yellow star grass, *Hypoxis hirsuta*.

Bittersweet *Celastrus scandens* (Sanctuary) (BUY) A climbing vine, 6–25 feet. Greenish-white. June. Fruit an orange colored shell which divides and discloses the scarlet pulp surrounding the seed. Found along roadsides and near streams, but is rapidly disappearing and needs protection. Will succeed in any situation where a decorative vine is desired, but is most effective sprawling over fences and stone walls.

Moonseed *Menispermum canadense* — Vine, climbing 3–12 feet. White. Berries black, with purple bloom, looking like frost grapes. June–July. Frequent on banks of streams and rocky slopes. Has very handsome ivy-like foliage, is easily grown from seed and is useful in most any situation. The name is from the crescent shaped seeds.

Virginia Creeper *Psedera quinquefolia* — A trailing or climbing vine, frequently ascending to the tops of trees. Whitish green. Berries cadet-blue. July. Common in open woods and thickets. Very popular and the most easily cultivated native vine. Particularly valuable because it adheres to smooth surfaces by disc-bearing tendrils.

Common Blue Violet *Viola papilionacea* — 3–7 inches. Violet-purple. April–June. Common in low moist grounds everywhere. Easily transplanted and established in either shade or sun. The type (*Viola palmata*) has deeply lobed leaves which add to its attractiveness.

Downy Yellow Violet *Viola pubescens* — 6–16 inches. Golden-yellow. April–May. Common in woodlands and along shaded roadsides in rather dry situations. A showy violet, easily grown, that will add a touch of bright color to any woodland planting. Also useful in the rock garden.

COMMON BLUE VIOLET (*Viola papilionacea*)
(*See page 134*)

DOWNY YELLOW VIOLET (*Viola pubescens*)
Photo by E. L. Crandall (*See page 134*)

SUNDROPS (*Œnothera fruticosa*)

Photo by C. R. Shoemaker (*See page 137*)

This day-flowering "evening primrose" cunningly hides its nectar so it can be reached only by long-tongued bumble bees and butterflies that come bearing pollen for deposit on its high stigma, which is so placed that self-fertilization is impossible.

Dog Violet *Viola conspersa* — 3–5 inches. Light bluish-purple. April–June. Not uncommon in moist woods and along shady borders of roads and fields. The compact little plants are easily grown, of neat appearance and useful for cover purposes.

Sundrops *Œnothera fruticosa* — 12–30 inches. Pure yellow. May–July. Rather common in fields and on roadsides. This is one of the native perennials of such conspicuous beauty that it has found its way into the catalogs of all the leading dealers. Both foliage and blossoms are attractive and it is easily grown. Very useful in rather dry, open situations and rock gardens.

Wild Sarsaparilla *Aralia nudicaulis* — 7–12 inches. Greenish white. Berries purple-blue, in clusters. May–June. Common in moist and rocky woods. The wild sarsaparilla is pleasing both in foliage and in fruit. It looks well in combination with other woodland plants of similar habitat.

Bearberry *Arctostaphylos Uva-ursi* — (BUY) A trailer. White or pink. May–June. Common in dry rocky soil near the coast. This handsome evergreen creeper is best established by obtaining plants that have been grown in pots. When transplanted from the wild very few specimens survive. It has no equal for a permanent ground

covering on exposed, sandy banks and rocks, in open sun.

Loosestrife *Lysimachia terrestris* 8–20 inches. Golden yellow. June–August. Common in moist, sandy soil, particularly along brooks and in low meadows. The spire-like clusters of this beautiful summer-blooming plant are extremely decorative and it should be planted freely where conditions like those of its natural habitat can be approximated. I have found no difficulty in transplanting it, even when in bloom, and once established it takes care of itself.

Butterfly Weed *Asclepias tuberosa* (Sanctuary) (BUY) 12–30 inches. Bright orange. June–September. Frequent in poor soil in dry fields and on banks. Young plants are not difficult to establish in similar situations as they stand transplanting well and require no special care. The handsomest wild flower of its color.

Swamp Milkweed *Asclepias incarnata* 2–4 feet. Crimson-pink. July–September. Common in swamps. A valuable plant for bog gardens or on the borders of pools. Not difficult to establish.

Jacob's Ladder *Polemonium van-bruntiæ* (BUY) 2–3 feet. Blue-violet. May–July. Found in moist open places along mountain streams and in upland swamps. Rare. This beautiful

JACOB'S LADDER (*Polemonium Van-Bruntiæ*)
(*See page 138*)

There are two species of polemonium which take kindly to cultivation, the Jacob's ladder shown above and the Greek valerian (*Polemonium reptans*). The Jacob's ladder is exceedingly rare and is found only along mountain streams and in upland swamps.

TURTLE HEAD (*Chelone glabra*)
Photo by C. R. Shoemaker (*See page 142*)

CULVER'S ROOT (*Veronica virginica*)
Photo by C. R. Shoemaker (*See page 143*)

and stately plant makes an exquisite combination with the meadow rue, especially during July when both plants are in bloom. Not difficult to transplant or grow, if one is fortunate enough to locate it.

Forget-me-not *Myosotis scorpioides* 6–12 inches. Bright blue. May–July. Frequent in moist places along brooks. *Myosotis scorpioides* is the only plant of foreign origin I have included in this list. I have done so because it escaped from cultivation and, so to speak, naturalized itself in congenial situations a great many years ago. Besides, we have a native forget-me-not (*Myosotis laxa*), which is almost exactly similar to the imported species, except that its blue flowers are so much smaller as to be inconspicuous. The forget-me-not is indifferent as to moisture and exposure as well as to soil, and may be appropriately used in any kind of natural planting, except where it is very dry and sunny.

Blue Vervain *Verbena hastata* 3–6 feet. Deep purple. July–September. Common in pastures and on the borders of cultivated fields. A very decorative plant which is easy to establish and flourishes almost anywhere.

Bee Balm *Monarda didyma* 24–30 inches. Scarlet-red. July–September. Frequent in moist ground along streams and on woodland borders. A very brilliant and

showy wild flower which has been a feature of hardy gardens since revolutionary times. It is listed in all flower catalogs and, if anything, is too responsive to cultivation, for, if not watched and restricted, it spreads so rapidly as to become a nuisance. May be used in any planting where a background of dark green foliage can be provided to bring its glowing color into strong relief.

Wild Bergamot *Monarda fistulosa* 2–3 feet. Pale lilac. June–September. Common in dry fields and fence corners. An attractive plant in cultivation. Easily moved from its native haunts where the color of the flowers varies considerably. Specimens should be chosen accordingly.

False Dragon-head *Physostegia virginiana* 2–3 feet. Lilac-pink. July–August. Occasional, in wet grounds, New York, increasing southward. Very variable as to color. Used freely in cultivation and, when purchased from dealers, the color is pleasing and pronounced. Should be treated the same as bee balm and similarly restricted because of its tendency to spread in all directions by underground running roots.

Turtle-head *Chelone glabra* 1–3 feet. White, tinted pink. July–September. Found on moist banks, in swamps and on the margins of streams. An odd but attractive plant that

is easy to transplant and establish. It is listed in most catalogs as suitable for the hardy border, but it looks much more at home in the bog garden or beside a woodland brook.

Beard-tongue *Pentstemon pubescens* 1–3 feet. White, tinged pink. May–July. A common dry-field and roadside plant of pleasing habit. Occasional specimens produce flowers of good color and these should be chosen when transplanting from the wild. The garden pentstemon (*P. barbatus torreyi*) from the far west, is a very showy member of the family and its use is permissible in wild meadow plantings.

Monkey-flower *Mimulus ringens* (Sanctuary) (BUY) 1–3 feet. Purple-blue. July–September. Found in swamps and wet meadows and along streams. This beautiful wild flower is not easy to establish unless transplanted with great care and set in a location closely similar to its natural habitat. It is, however, worth all the care and attention necessary to success.

Culver's Root *Veronica virginica* 2–7 feet. White. July–September. Found in moist woods and meadows. This tall, strikingly decorative plant is excellent for massing in deep woods at some distance from drives or paths. In such locations, it is a worthy successor to the black snakeroot (*Cimicifuga*

racemosa) which is through blooming by the time the culver's root displays its spire-like blossoms. Used in cultivation as a border plant and listed in many catalogs.

Cardinal Flower *Lobelia cardinalis* (Sanctuary) (BUY) 2–4 feet. Rich, deep red. August–September. Frequent in low, moist ground, growing often from the bottom of sluggish streams. It seems remarkable that this plant, naturally thriving in water, or wet places, should develop and bloom just as well when transferred to the garden border. Such is the case, however. Personally I think it is out of place among ordinary garden flowers: and I much prefer to see it in locations like those to which it is accustomed, or in deep shaded woodlands, where its torch-like spikes of flowers actually seem to light up the gloomy surroundings. The cardinal flower should not be planted in masses. Single specimens, or at the most two or three in a close group, are much more effective and natural. This plant needs protection as it is rapidly being exterminated in the more frequented sections.

Ironweed *Vernonia noveboracensis* 3–6 feet. Madder-purple. August–September. Found in moist ground and is more frequent near the coast. Some of the individual blossoms of the ironweed have a very bad

BEARD TONGUE (*Pentstemon hirsutus*)
Photo by C. R. Shoemaker (*See page 143*)

The fifth stamen (*pente-stemon*) gives this plant its name. It is a curiously curved and bewhiskered affair which keeps out nectar pilferers and admits the long tongue only of the bumble bee, who gets the pollen right in the face.

THE MONKEY FLOWER (*Mimilus ringens*)

Photo by C. R. Shoemaker (*See page 143*)

The stigma of this flower is so extremely sensitive that it curls up when a visiting insect touches it, thus exposing the anthers behind covered with pollen ready to be carried away, and effectually preventing self-fertilization.

habit of turning brown early, while others in the cluster retain their bright color. For this reason the plant looks much better at a distance than it does close at hand. It is excellent for grouping with sunflowers and heleniums in plantings along streams and on the borders of meadows. Not difficult to transplant or cultivate.

Joe-Pye-Weed *Eupatorium purpureum* 4–12 feet. Dull pink. August–September. Common on borders of swamps and in low moist ground. This easily cultivated and decorative plant is particularly fine for massing with sunflowers, heleniums and other tall-growing wild flowers frequenting low, wet places. A very beautiful and striking combination at the New York Zoological Gardens is made of the wild rice (*Zizania aquatica*), joe-pye-weed and helenium. As wild rice is an annual, it must be raised from seed, or young seedlings may be purchased from dealers in aquatic plants.

White Snakeroot *Eupatorium urticæfolium* 1–3 feet. Snowy-white. July–September. Common in moist rich woods. This is the most attractive and graceful member of the Boneset family. The others, except joe-pye-weed, are too coarse in habit and their flowers are too homely to deserve much consideration in wild plantings. The white

snakeroot is not particular as to position and contrasts finely with its close relative the blue mist flower (*Eupatorium cœlestinum*), a very lovely western and southern species sold by most dealers. It also combines well with the various lavender and purple asters of early fall.

Showy Golden-rod *Solidago speciosa* — 3–5 feet. Golden yellow. August–October. Common in dry, open fields and thickets. The sturdiest and showiest of the golden-rods, with conspicuously large individual flowers. Not particular as regards exposure and of simple cultural requirements.

Early Golden-rod *Solidago juncea* — 2–3 feet. Golden yellow. July–September. Common on dry rocky banks and roadsides. A graceful elm-shaped plant, which succeeds anywhere in open sunny places.

Gray Golden-rod *Solidago nemoralis* — 6–25 inches. Deep golden yellow. August–October. Common everywhere. The very brilliant flowers of this rather low-growing plant make it one of the best for dry, sunny locations. It is a welcome addition to the sunny rock garden.

Wavy-leaved Aster *Aster undulatus* — 1–3 feet. Light violet-blue. September–October. A common but handsome aster of attractive habit and easily established in any location.

JOE PYE WEED (*Eupatorium purpureum*)
Photo by E. L. Crandall

(*See page 147*)

ROBIN'S PLANTAIN (*Erigeron pulchellus*)
Photo by E. L. Crandall (*See page 157*)

THE CANADA VIOLET MAKES LARGE COLONIES
Photo by E. T. Wherry (*See page 171*)

Smooth Aster *Aster lævis* 2–4 feet. Light violet-blue. September–October. A particularly handsome species of robust habit that flourishes in dry sunny situations.

Heath Aster *Aster ericoides* 1–3 feet. White. September–November. Common in dry fields and along roadsides. It is remarkable how a little cultivation develops the natural beauty of this plant. It should be introduced liberally in naturalistic plantings where its favorite conditions prevail.

New York Aster *Aster novi-belgii* 1–3 feet. Lilac-blue. Common, especially near the coast, apparently preferring moist situations. The New York aster is a rival of the New England aster in beauty and many handsome varieties have been developed by European hybridizers, which can be purchased from dealers. The native type is, however, fully as handsome as any of the imported kinds when planted in masses.

Robin's Plantain *Erigeron pulchellus* 10–22 inches. Pale lilac-pink. May–June. Common everywhere. Robin's plantain grows in dense and extensive communities, its shining rosettes of basal leaves completely covering the ground. Its flowers are really attractive and it deserves more attention than has hitherto been accorded it. No wild flower is easier to transplant.

Ox-eye *Heliopsis helianthoides* — 3–4 feet. Yellow. August–September. Frequent in dry copses, increasing south and west. The ox-eye, and its near relative, *Heliopsis scabra*, have long been in cultivation and are recommended by dealers as desirable for the hardy border. While somewhat coarse in habit, the flowers are showy and effective.

Purple Cone-flower *Brauneria purpurea* — 2–3 feet. Magenta-pink. Frequent in rich soil, increasing south and west. This is another native that has been cultivated for years as a hardy border plant. Care should be taken in locating it, so that its color will not clash with that of its neighbors.

Black-eyed Susan *Rudbeckia hirta* — 1–2 feet. Deep golden yellow. June–August. Common in dry fields and sandy meadows. While a biennial, strictly speaking, this plant increases by offsets from the roots as well as from self-sown seed. It is easy to transplant, improves under simple cultivation and is extremely desirable in many wild plantings. It is apt to vary in color. I found one plant in the Harlem valley with flowers having a broad band of crimson around the cone.

Tall Sunflower *Helianthus giganteus* — 3–12 feet. Light yellow. August–September. Common in swamps and wet meadows. A tall, handsome species that can be used to

JACK-IN-THE-PULPIT (*Arisæma triphyllum*)
Photo by E. L. Crandall

(*See page 156*)

BELLWORT (*Uvularia perfoliata*)

Photo by E. L. Crandall (*See page 156*)

Linnæus named the bellwort family *uvularia* because he fancied a resemblance between the drooping flower and the palate (*uvula*) hanging from the roof of one's mouth.

advantage in many naturalistic plantings, as along the edges of thickets and in sunny fields.

Ten Petaled Sunflower *Helianthus decapetalus* — 2–5 feet. Pure yellow. August–September. Common in copses and on wooded slopes. A showy species of easy culture which does well in dry situations.

Jerusalem Artichoke *Helianthus tuberosus* — 5–12 feet. Golden yellow. September–October. Frequent in damp soil. This species is grown in gardens for its edible roots. Looks very striking in fence rows and in plantings on the borders of fields where its brilliant flowers show to best advantage.

Sneezeweed *Helenium autumnale* — 2–5 feet. Golden yellow. August–September. Common on river banks and in wet meadows. An extremely decorative plant with handsome flowers in clusters that may be used to advantage in numerous attractive combinations. The garden varieties, Riverton Gem and Riverton Beauty, are particularly beautiful and it is entirely permissible to utilize them in wild gardening.

GROUP NO. 2. WILD FLOWERS THAT THRIVE BEST IN CIRCUMNEUTRAL SOILS

Jack-in-the-Pulpit *Arisæma triphyllum* — 12–30 inches. April–July. Yellow-green, with brown-purple stripes. Quite pale when growing in the sun. Berries bright scarlet. Moist places. Easily grown from seed. Most effective planted singly among ferns.

Large-flowered Bellwort *Uvularia grandiflora* — 10–15 inches. Creamy buff. April–June. In rich moist woods everywhere. Fine for massing with ferns and under shrubs.

Large Flowering Trillium *Trillium grandiflorum* — (BUY) 10–18 inches. Snowy-white, changing to pink. Berry red. Common in the northern part of our range, but only occasional south of the Adirondacks. Rich rocky woods. One of our handsomest wild flowers; superb when grouped in masses in moist but well-drained woodland glades. Plant tubers six to eight inches deep.

Meadow Lily *Lilium canadense* — (BUY) 3–5 feet. Yellow to orange-red. Common in moist meadows, but thrives in any situation where roots and stems are protected and the soil does not become actually dry, as along woodland paths and in open glades. Set bulbs six to eight inches deep.

SHOWY ORCHIS (*O. spectabile*)

Photo by E. L. Crandall

(*See page 159*)

SHOWY LADY'S SLIPPER (*Cypripedium hirsutum*)
Photo by E. L. Crandall (*See page 159*)

Dogtooth Violet *Erythronium americanum*

A more appropriate common name is "Trout Lily." 4–8 inches. Yellow. April–May. Common in moist woods and along brooks. Foliage disappears soon after blooming. To collect, mark spots where plants are thickest and dig bulbs in June or later. They will be found at a depth of from six to fifteen inches. Select the largest ones and replant in masses, in moist stony locations. The mottled leaves make a beautiful showing. A close relative, *Erythronium albidum*, has white flowers and is common in the south and west, but infrequent east.

Showy Orchis *Orchis spectabilis*

(Sanctuary) (BUY) 5–10 inches. Rosy lavender and white. May–June. Frequent in moist, stony soil, in deciduous woods. Difficult to establish unless natural conditions are duplicated. Plant singly or in clumps of three to seven.

Showy Lady's Slipper *Cypripedium hirsutum*

(Sanctuary) (BUY) 18–24 inches. Frosty white, stained crimson. June–July. Not frequent, but plentiful locally, in swamps and wet woodlands. Considered by many our most beautiful wild flower. Does well and persists indefinitely when planted in continuously moist soil, in either sun or shade.

Wild Ginger *Asarum canadense* — 6–10 inches. Brown-purple. April–May. A low, spreading plant of our moist, rich woods which is attractive and valuable as a ground cover. Easy to grow. Some dealers offer *Asarum virginicum*, a desirable southern species with evergreen leaves, which should be better known.

Spring Beauty *Claytonia virginica* — 6–12 inches. Pale pink. March–May. Common everywhere in open moist woods. May be collected and treated the same as dogtooth violet.

Wild Pink *Silene pennsylvanica* — (Sanctuary) (BUY) 4–9 inches. Crimson-pink. May–June. Frequent on rock ledges and outcrops but difficult to dig because of its long, tap roots. Easy to establish, however, and its blossoms give a fine color effect in the rock garden where it forms attractive clumps.

Liverwort *Hepatica triloba* — (Sanctuary) (BUY) 3 inches. Lilac, white, pale purple. March–May. The earliest spring flower. Common everywhere, but rapidly disappearing. Succeeds especially well under cultivation in almost any situation. *Hepatica acutiloba* is a southern species offered by dealers that is closely allied to *triloba* and has flowers of brighter coloring.

LARGE FLOWERING TRILLIUM (*T. grandiflorum*)
Photo by C. R. Shoemaker (*See page 156*)

WILD GINGER (*Asarum canadense*)
Photo by E. T. Wherry (*See page 160*)

SPRING BEAUTY (*Claytonia virginica*)

Photo by E. L. Crandall (*See page 160*)

First cousin to the gaudy portulaca, and to the pestiferous "pussley" of our gardens, the dainty spring beauty, like both relatives, opens its starry blossoms only in the sunshine.

Early Meadow Rue *Thalictrum dioicum* 1–2 feet. Green, terra-cotta. April–May. A graceful and beautiful plant, not uncommon on dry rocky hillsides. Useful in making extensive masses of attractive foliage.

Marsh Marigold *Caltha palustris* (Sanctuary) (BUY) 8–24 inches. Golden yellow. April–May. The glory of our wet meadows and one of the earliest spring flowering plants. May be lifted with the hands out of the soft mud and if set in a moist, open place, or even in shallow water, will succeed and persist indefinitely.

Columbine *Aquilegia canadensis* (Sanctuary) (BUY) 1–2 feet. Scarlet-yellow. April–early July. Common on dryish rocky ledges everywhere, but is disappearing from many localities and should have protection. Like the wild pink, it has long tap roots, but is easy to establish. A fine rock garden plant.

Blue Cohosh *Caulophyllum thalictroides* (BUY) 1–3 feet. Greenish or yellowish. April–May. Berries cadet-blue, in loose clusters. Found in rich damp woodlands. Excellent for massing in the same manner as is suggested for the baneberries.

Twinleaf *Jeffersonia diphylla* (BUY) 15–18 inches. White. April–May. Frequent in well-drained woods from western New York, south to Tennessee and west to the

Mississippi. A delicate, handsome plant of easy culture. Should be planted in masses.

Celandine Poppy *Stylophorum diphyllum* (BUY) 12–16 inches. Golden Yellow. April–May. Damp shaded spots, from Pennsylvania south to Tennessee and west to Missouri. Its light green foliage and golden yellow flowers are very handsome. It prefers moist, shaded places.

Mountain Fringe *Adlumia fungosa* (BUY) 8–12 feet. White, tinted magenta pink. June–October. A not uncommon biennial in moist situations on rocky slopes and in thickets. A handsome vine if planted where it can trail over rocks or shrubbery.

Dutchman's Breeches *Dicentra cucullaria* 5–9 inches. White, yellow tipped. April–May. Common in thin woods and on dryish rocky slopes. May be transplanted when in flower. Foliage disappears soon after the flowers fade, so it should be combined with the maidenhair or fragile bladder fern, either of which will soon cover the bare spot. Squirrel corn, *Dicentra canadensis*, is a similar species, but grows from little tubers like yellow peas. Another attractive species is the wild bleeding heart, *Dicentra eximia* (BUY), found on rocky slopes

WILD PINK (*Silene pennsylvanica*)
Photo by E. L. Crandall (*See page 160*)

LIVERWORT (*Hepatica triloba*)
Photo by E. L. Crandall (*See page 160*)

EARLY RUE (*Thalictrum dioicum*)
Photo by C. R. Shoemaker
(*See page 163*)

COLUMBINE (*Aquilegia canadensis*)
Photo by E. L. Crandall
(*See page 163*)

of the Alleghany mountains from Pennsylvania south. This prefers a moderately acid soil, grows from one to two feet high and bears delicate pink flowers.

Pale Corydalis *Corydalis sempervirens* 8–22 inches. Pale pink. May–August. A handsome biennial, rather frequent in dry rocky situations, which makes itself perfectly at home almost anywhere. It increases rapidly by self-seeding.

Toothwort or Crinkleroot *Dentaria diphylla* 8–10 inches. White. Fragrant. May. Common in rich woodlands and damp meadows. Handsome planted in masses. *Dentaria laciniata* is a similar species with deeply cut leaves, and the flowers tinted with pink. Frequently found growing with the first named. Both are easily transplanted and established.

Early Saxifrage *Saxifraga virginiensis* 4–10 inches. White. April–May. Common everywhere on and in crevices in rocks. A good subject for the rock garden, in either sun or shade.

Bishop's Cap *Mitella diphylla* (Sanctuary) (BUY) 8–16 inches. White. April–May. Frequent on damp rocks and steep wooded slopes. The fringed blossoms are shaped like snow crystals. A gem for the shady rock garden.

Grass-of-Parnassus *Parnassia caroliniana* (BUY) 18 inches. Creamy white. June–September. Plentiful locally in swamps and wet meadows. Seems to prefer sandy soil and is at home in the bog garden. The flowers are delicately veined with pale green.

False Indigo *Baptisia australis* (BUY) 3–6 feet. Violet-blue. June–July. Not uncommon in rich alluvial soil, Pennsylvania south to Georgia and west to Missouri. Very handsome in cultivation.

Wild Senna *Cassia marilandica* 3–6 feet. Golden yellow. July–August. Frequent in swamps and alluvial soil. Improves under cultivation when given a favorable location.

Herb Robert *Geranium robertianum* 10–15 inches. Pink. May–September. Not uncommon in moist or dry woods, or on rocky hillsides, in both sun and shade. A very ornamental little plant for rock gardens.

Swamp Rose-Mallow *Hibiscus Moscheutos* (BUY) 4–6 feet. Pale pink to deep rose. August–September. Common in the brackish waters of marshes near the coast. Takes kindly to cultivation and will flourish in ordinary garden soil, even in dry situations. Has been greatly improved by hybridization with the southern species *Hibiscus coccineus*, and can be purchased of most nurserymen in all

BLUE COHOSH (*Caulophyllum thalictroides*)
Photo by E. L. Crandall (*See page 163*)

TWINLEAF (*Jeffersonia diphylla*)
Photo by H. S. Barber (*See page 163*)

DUTCHMAN'S BREECHES (*Dicentra cucu'laria*)
Photo by C. R. Shoemaker (*See page 164*)

WILD BLEEDING HEART (*Dicentra eximia*)
Photo by C. R. Shoemaker (*See page 164*)

colors from white to deep blood-red and crimson. A superb plant for meadow and bog gardens.

Sweet White Violet *Viola blanda* — 3–5 inches. White, with purple veins. Fragrant. April–May. Common in moist and often in dry situations. Improves with cultivation and makes a very attractive ground cover.

Canada Violet *Viola canadensis* — (BUY) 5–15 inches. White, tinted violet on the outside. Fragrant. May–July. Common locally in well-drained upland woods, northward. No wild plant responds more satisfactorily to transplanting and cultivation than the Canada violet. One of its merits is that it blooms continuously throughout the entire growing season. The handsome flowers resemble tiny white butterflies. It self-seeds profusely and will soon occupy all available space in its vicinity.

Early Meadow Parsnip or Golden Alexander *Zizia aurea* — 15–30 inches. Pale golden yellow. May–June. Common in meadows, often covering large areas and contrasting beautifully with the bright green grass of spring. Not difficult to transplant and establish in similar situations. A close relative of the wild carrot, or Queen Anne's lace, the beautiful foreign weed which has taken possession of so many of our fields.

American Cowslip or Shooting Star *Dodecatheon meadia*

(Sanctuary) (BUY) 8-20 inches. Flesh-white to pink. April–May. Frequent on moist hillsides and tops of cliffs in open woods, Pennsylvania, south to Georgia and Texas and west to the Missouri River. The shooting star or American cowslip has been listed in the leading flower catalogs for a great many years and is recommended for planting in the hardy border. It is much happier, however, and far more beautiful when grown in locations resembling as closely as possible its natural haunts. It is easy of culture in either sun or shade if supplied with a reasonable amount of moisture and should be planted in clumps or large groups. Its flowers bear a marked resemblance to those of the cyclamen, though they are much smaller.

Large Marsh-Pink *Sabbatia dodecandra*

(Sanctuary) (BUY) 12–24 inches. Crimson-pink. July–August. Frequent locally on the sandy margins of brackish ponds near the coast. This large-flowered and extremely handsome member of the Gentian family is a biennial, but is perpetual by underground roots or stolons. It does surprisingly well in wild plantings if given moist, sandy soil. It can be transplanted safely by those who are successful in locating it.

The Dainty Shooting Star
Dodecatheon Meadia

The Showy Bird's-Foot Violet
Viola pedata

Two-colored Bird's-Foot Violet
Viola pedata, var. *bicolor*

Fringed Gentian *Gentiana crinita*

(Sanctuary) 1–3 feet high. Sky-blue. September–October. Formerly frequent in low, moist meadows and bogs, but rapidly disappearing. The fringed gentian will not bear transplanting and should be classed as an annual, as it usually completes its cycle of existence and dies within one year from the time the seed ripens in late fall. It can be propagated only from seed, which should be sown as soon as possible after gathering in moist, rich, preferably sandy soil and protected during the winter with a light mulch of dead leaves or grass. A surer way to grow it is to sow the seed in the kind of soil suggested, in two or three inch pots, in a cool greenhouse or cold frame, in a sheltered location. The following spring, when the young plants have reached suitable size, they can be transferred to previously prepared spots where it is desired to have them bloom. The fringed gentian should always be picked sparingly and enough flowers left on every plant to perfect and ripen seed.

Bottle or Closed Gentian *Gentiana andrewsii*

(Sanctuary) (BUY) 1–2 feet. Violet-blue. August–October. Rather common in rich soil on borders of woods and banks of streams. This peculiar and distinctive gentian is a perennial and takes very kindly to culti-

vation. It is easily transplanted and is rather indifferent as to soil and exposure, provided it is not permitted to suffer from lack of moisture.

Four-leaved Milkweed *Asclepias quadrifolia* 12–18 inches. Pale lilac pink. May–July. Frequent in dry woods and copses. My experience is that this dainty and delicate plant improves wonderfully when transplanted to favorable situations on shaded slopes. Its flowers are extremely dainty.

Wild Blue Phlox *Phlox divaricata* (Sanctuary) (BUY) 9–18 inches. Lavender-blue. Slightly fragrant. April–June. Frequent locally in rocky woods, southern New York, increasing south and west. This plant is so handsome in both foliage and flower, that it has been introduced into gardens and is listed in most catalogs. It should be planted in masses to produce the most striking effects. Not particular as to soil or exposure.

Moss Pink *Phlox subulata* (BUY) 2–4 inches. Magenta pink, lavender and white. April–September. Not uncommon in sandy or rocky ground on hills and cliffs. The moss pink has been in cultivation for a great many years and is really more frequent on home grounds than it is in the wild. The so-called pink variety is too near magenta to be pleasing to most people, but the white and lavender sorts are very attractive.

GRASS OF PARNASSUS (*Parnassia caroliniana*)
Photo by C. R. Shoemaker (*See page 168*)

Three stout and infertile stamens at the base of each petal form a *chevaux-de-frise* which the insect visitor must surmount to get at the honey pots of the parnassus. Otherwise he could stand on any petal and sip the nectar, without getting dusty with pollen to be carried to other blossoms.

CANADA VIOLET (*Viola canadensis*)
Photo by E. L. Crandall (*See page 171*)

VIRGINIA COWSLIP (*Mertensia virginica*)
Photo by E. L. Crandall (*See page 177*)

Greek Valerian *Polemonium reptans* (BUY) 8–12 inches. Blue-violet. April–May. Frequent locally in thin dryish woods, southern New York, increasing south and west. This neat and attractive little plant is not as well known as it should be. Its dark green foliage and bright, nodding bell-shaped flowers are admired by everyone. Should be planted in clumps or masses to produce the best effect.

Virginia Cowslip *Mertensia virginica* (Sanctuary) (BUY) 1–2 feet. Buds pink, opening sky-blue. March–May. Found in low meadows and on the banks of streams, in both shade and sun, southern New York, increasing south and west. This showy and beautiful wild flower is frequently cultivated and is a gem for a moist shady corner. It is sometimes called blue bells, is of the easiest culture and increases rapidly from self-sown seed. The foliage withers and disappears as soon as the seed ripens and it should therefore be planted in combination with ferns of medium height like the maidenhair, the narrow-leaved spleenwort or the lady fern, that will fill the vacancies it leaves.

Bluebell *Campanula rotundifolia* (Sanctuary) (BUY) 6–18 inches. Light purple. June–September. Common locally on rocky cliffs and sometimes in barren sandy

fields, in either shade or sun. This dainty little plant is identical with the bluebells of Scotland and, aside from its graceful beauty, is prized by many on that account. It is not difficult to establish in congenial locations and when this has been accomplished, it is very likely to spread to similar spots in the vicinity.

Great Blue Lobelia
Lobelia syphilitica

1–3 feet. Light blue violet. July–September. Common in low moist ground. A close and very good looking relative of the cardinal flower that is easy to transplant and simple in its cultural requirements. May be used with very pleasing effect in meadow and bog gardens and in woodland glades.

Blue-stemmed Golden-rod
Solidago cæsia

1–3 feet. Light golden yellow. August–October. Common in dry shady places. This slender, graceful golden-rod is supposed to be the species from which the family takes its name. It thrives under culture and is useful in dry situations.

New England Aster
Aster novæ-angliæ

2–5 feet. Rosy lilac to deep purple. August–October. Perhaps the most popular member of the Aster family. Has been long in cultivation and European hybridizers have developed numerous varieties of attrac-

WATER ARUM (*Calla palustris*)
(*See page 182*)

CANADA MAYFLOWER (*Maianthemum canadense*)
Photo by C. R. Shoemaker
(*See page 182*)

RATTLESNAKE PLANTAIN (*Epipactis pubescens*)
Photo by C. R. Shoemaker (*See page 185*)

This charming little plant takes its name from its net-veined leaves, resembling the mottling of the rattlesnake and not from the purely fanciful tale that the Indians used it to cure snake bites.

tive shades, particularly those approximating pink. However, pink-flowering specimens are not infrequent in our fields and, as all asters improve greatly in appearance under cultivation, I see little necessity for buying the imported hybrids.

Golden Ragwort *Senecio aureus* 18–32 inches. Deep golden yellow. May–July. Common in wet meadows. I consider this one of our handsomest and most useful wild flowers. Its basal leaves look like large violet leaves, while the stem leaves are so deeply cut that they resemble fern fronds. It grows naturally in dense communities and should be planted in masses, in moist situations, in either sun or shade. Its clusters of twenty or more brilliant golden yellow flowers, with orange centers, are especially striking where there is a background of greenery. It is not difficult to transplant or establish.

GROUP NO. 3. WILD FLOWERS THAT THRIVE BEST IN MINIMACID, OR MODERATELY ACID SOILS

Water Arum or Wild Calla *Calla palustris* — 6–8 inches. June. White. Berries red. Not uncommon in cold swamps. A gem for the bog garden.

Canada Mayflower *Maianthemum canadense* — 3–6 inches. White. May–June. Berries like those of false spikenard but smaller. Dry or well-drained knolls and hummocks, in shade. Common. Effective in large masses, as a ground cover under trees.

Wood Lily *Lilium philadelphicum* — (BUY) 1–3 feet. Orange-scarlet. June–July. Rather dry situations in thin woods. Common. Best used singly among ferns. Plant bulbs about four inches deep.

Turk's Cap Lily *Lilium superbum* — (BUY) 3–7 feet. Orange-yellow. July–August. Most frequent in open, moist places, near the coast. Improves in cultivation with same treatment as that recommended for the meadow lily.

Slender Blue Flag *Iris prismatica* — 1–3 feet. Violet-blue. May–June. Frequent locally in moist meadows near the coast. Not difficult to establish in moist places.

WOOD ANEMONE (*A. quinquefolia*)
Photo by E. L. Crandall (*See page 185*)

CREEPING DALIBARDA (*D. repens*)
Photo by E. L. Crandall (*See page 186*)

A CARPET OF PIPSISSEWA

Photo by H. S. Barber

(*See page 190*)

Rattlesnake Plantain *Epipactis pubescens* (Sanctuary) (BUY) 6–12 inches. White. July–August. The beauty of this little orchid is in its bluish-green leaves, daintily veined with white. It grows in clumps, preferably under evergreens and makes a lovely ground cover in congenial locations.

Yellow Fringed Orchis *Habenaria ciliaris* (Sanctuary) (BUY) 18–24 inches. Orange-yellow. July–August. Not common: prefers meadows and moist, sandy situations, but thrives under cultivation and is easy to establish. An exceedingly handsome and striking flower.

Water Lily *Castalia odorata* (BUY) White. June–September. Common in warm ponds everywhere. The best and showiest plant for water gardens. There is a variety, *rosea*, that is deep pink in color and another miniature variety, *minor*, with flowers less than three inches across.

Wood Anemone *Anemone quinquefolia* (Sanctuary) (BUY) 4–8 inches. White. April–June. Common in and on the borders of moist open woods. Somewhat difficult to establish. Offered by some dealers as *A. nemorosa*. If grouped in good-sized masses, in shady places, it presents a very pleasing appearance.

Early Buttercup *Ranunculus fasicularis* — 6–12 inches. Deep yellow. Late April–May. The first buttercup of early spring; found on moist wooded hillsides everywhere. Should be planted in clumps of a dozen or more in similar situations.

Orangeroot *Hydrastis canadensis* — (BUY) 1 foot. Greenish-white. April. Berries red, in clusters. Frequent in moist woods, Pennsylvania south to Georgia and west to the Mississippi. Attractive when planted either singly or in clumps.

Creeping Dalibarda *Dalibarda repens* — (BUY) 4–6 inches. White. July–September. A beautiful but rare woodland plant with attractive foliage, found in upland woods, particularly on the banks of streams. It is of easy culture and a desirable addition to the wild garden.

Wild Indigo *Baptisia tinctoria* — (Sanctuary) (BUY) 18–24 inches. Yellow. June–August. Frequent locally in dry, sandy soil and makes a luxurious, showy bush in favorable situations, in full sun.

Ground Nut *Apios tuberosa* — A vine climbing 4 to 5 feet. Brownish-maroon. Fragrant. August–September. Frequent in low, damp places, growing from an edible tuber. An exceedingly desirable vine for moist banks, or as a cover for fences and stumps.

COMMON SPEEDWELL (*Veronica officinalis*)
Photo by E. L. Crandall (*See page 192*)

QUAKER LADIES (*Houstonia cærulea*)
Photo by E. L. Crandall (*See page 195*)

PARTRIDGEBERRY (*Mitchella repens*)
Photo by C. R. Shoemaker (*See page 195*)

GOLDEN ASTER (*Chrysopsis mariana*)
Photo by C. R. Shoemaker (*See page 196*)

Fringed Milkwort *Polygala paucifolia* (BUY) 3–6 inches. Crimson-pink. May–July. Not uncommon and frequently carpets the ground in damp, rich woods, particularly under coniferous evergreens. Requires care to establish, but should not be omitted from any woodland planting if a congenial location can be found. Is also called "Fringed Polygala."

Fox Grape *Vitis labrusca* Vine, climbing to the tops of trees. Flowers greenish with violet-like fragrance. Berries dark purple with bluish bloom. May–June. Common in upland thickets. This vine, and its near relative the river-grape, *Vitis vulpina*, common on banks of streams, are very attractive in cultivation, and both should be used more extensively than they have been for covering unsightly objects.

Bird-foot Violet *Viola pedata* (Sanctuary) (BUY) 4–8 inches. Lilac or blue violet. In the variety *bicolor*, known as the wild pansy, the two upper petals are deep purple. April–June. Frequent locally in dry, sandy soil, both on open banks and slopes and in thin woods. This beautiful violet is rather easily established and the fact that it flourishes in poor soil and the most exposed situations, makes it extremely valuable.

Round-leaved Violet *Viola rotundifolia* 2–4 inches. Golden yellow. April–May. Frequent locally in cool, damp woods, usually in shade. I find it rather difficult to establish. It is very attractive, however, and will increase in numbers by self-seeding.

Meadow-beauty *Rhexia virginica* (BUY) 10–18 inches. Rosy-lilac. July–August. Frequent locally in sandy marshes, increasing south and west. Because of its blooming season in midsummer, the meadow-beauty is extremely valuable in the bog garden, forming patches of brilliant color which harmonize perfectly with the prevailing floral tints. Not difficult to establish and spreads freely by self-seeding.

Fireweed *Epilobium angustifolium* 3–6 feet. Magenta-pink. July–August. Common on newly cleared or recently burned-over ground. Not difficult to establish and both useful and attractive in rather dry open situations, provided it is placed where its color will not clash with that of other flowers.

Pipsissewa *Chimaphila umbellata* (Sanctuary) (BUY) 6–10 inches. Flesh-pink. Fragrant. June–July. Not uncommon in dry coniferous woods, favoring locations under pines and hemlocks. The closely related spotted wintergreen (*Chimaphila maculata*), also sweetly fragrant, differs chief-

ly in its greenish-white-marked leaves. These two plants have wiry roots of indefinite length and are difficult to establish unless pot-grown specimens are obtained. Both, however, are so exceptionally attractive that they should not be omitted from any woodland planting if situations similar to their natural haunts are available.

Shinleaf *Pyrola elliptica* — 6–10 inches. White. Very fragrant. June–July. A rather common plant of dry woods in summer. The round-leaved pyrola (*P. americana*) is similar but much taller, the flower stem ascending sometimes to eighteen inches. Both species have long underground roots like the *Chimaphilas* and should be treated in the same manner in cultivation.

Wintergreen or Checkerberry *Gaultheria procumbens* — 2–5 inches. White. Berry cherry-red. July–August. Common in dry and evergreen woodlands. Rarely successful when transplanted, but nursery grown plants are rather easy to establish if given the same treatment as the trailing arbutus.

Star Flower *Trientalis americana* — 3–6 inches. White. May–June. Common in moist thin woods, especially on mountain slopes. A good sized mass planting of the star flower is very pleasing because of its beautiful light-green, shiny leaves and deli-

cate star-shaped flowers. Transplants readily and is easy to establish in congenial locations.

Puccoon *Lithospermum canescens* (BUY) 6–18 inches. Orange-yellow. March–June. Not common: rare in New England. Found in dry soil. A strikingly handsome plant in cultivation with large showy blossoms. It is valuable for planting in barren areas where few equally attractive plants will grow.

Common Speedwell *Veronica officinalis* 3–4 inches. Trailing. Light lavender. June–August. Common in dry fields and thin upland woods. I am inclined to think that this little creeping veronica is better suited for a ground cover under surface-rooting trees, than either partridge berry or creeping Charlie. It forms rather handsome mats and is always certain to grow. Sometimes the other creepers named fail to survive in such locations.

Beefsteak Plant or Wood Betony *Pedicularis canadensis* 5–12 inches. Dull crimson. May–July. Common everywhere, apparently preferring rather dry woods. This plant and its fall-blooming relative (*P. lanceolata*) which has pale yellow flowers, are not particularly attractive when viewed at close range. The foliage of both, however, is fern-like and the blossoms of *canadensis*, at a distance, resemble primroses. Bearing this

BELLWORT AND CLINTONIA

"Gray should not have named Clintonia for the governor of New York. What is he to the lovers of flowers in Massachusetts? If named after a man, it must be a man of flowers."—THOREAU.

PINK MOCCASIN FLOWER (*Cypripedium acaule*)
Photo by E. L. Crandall

"Because most people cannot forbear picking this exquisite flower . . . it is becoming rarer every year, until the finding of one in the deep forest, where it must now hide, has become the event of a day's walk."—BLANCHAN.

in mind, many situations can be found where, if planted in masses, the latter will produce very striking and pleasing effects.

Bluets or Quaker Ladies *Houstonia cærulea* 3–6 inches. White, tinted blue-violet. April–October. Common in moist, grassy places and sandy fields. Easy to transplant and establish and will cover a large area by self-seeding. A closely related species, *Houstonia purpurea*, from the southern states, is offered by some growers. It is taller than the first named and the flowers are deeper in color.

Partridge-berry *Mitchella repens* (Sanctuary) (BUY) Trailing. White and pink. Berries, crimson-red. June. Common in woods and shaded borders of fields. This lovely little creeper is as useful as it is charming, and there are few places, moist or dry, in sun or shade, where it will not flourish, open its sweetly fragrant twin blossoms and ripen its bright double berries. It is easy to move from the wild, easy to establish, requires no after care and attends strictly to its function of covering what would otherwise be barren patches of earth.

Climbing Boneset *Mikania scandens* Vine. 5–15 feet long. Flesh-pink. July–September. Not uncommon in favorable locations along river banks and in the margins of swamps. A very attractive

twining climber, useful for covering stone walls, fences and stumps in situations where the soil is rich and continually moist.

Blazing Star *Liatris scariosa* — 2–4 feet. Rosy-purple. August–September. Not uncommon in dry fields and along roadsides. This easily handled and showy plant is extremely valuable for dry, sunny localities.

Golden Aster *Chrysopsis mariana* — (BUY) 1–2 feet. Golden-yellow. August–September. Common along dry, sandy roadsides near the coast. This is another useful plant in any sunny spot where the soil is poor, sandy and moderately acid. Its flowers are brilliant in color and its gray-green foliage makes a pleasing contrast. Easily transplanted and established.

Showy Aster *Aster spectabilis* — 1–2 feet. Blue-violet. August–October. Found only near the coast. Its large showy flowers and its ease of cultivation in sandy soil make this species one of the most useful of the asters.

Double-Bristled Aster *Aster (Diplopappus) linariifolius* — (BUY) 1–2 feet. Light-violet. September–October. Common in dry fields everywhere. I consider this one of the most desirable asters because of its neat habit, attractive foliage, and large showy flowers. It transplants easily, self-seeds freely and is indispensable in the sunny rock

BELLWORT AND CLINTONIA

"Gray should not have named Clintonia for the governor of New York. What is he to the lovers of flowers in Massachusetts? If named after a man, it must be a man of flowers."—THOREAU.

PINK MOCCASIN FLOWER (*Cypripedium acaule*)
Photo by E. L. Crandall

"Because most people cannot forbear picking this exquisite flower . . . it is becoming rarer every year, until the finding of one in the deep forest, where it must now hide, has become the event of a day's walk."—BLANCHAN.

garden or as a cover for dry, infertile banks and bare places.

Pussy-toes *Antennaria plantaginifolia* 4–8 inches. White. May–June. Common on dry slopes and in dry fields. The grayish foliage and unique flowers of this little everlasting make it extremely attractive and desirable as a ground cover in barren sunny places, where so few plants will thrive.

Pearly Everlasting *Anaphalis margaritacea* 1–3 feet. White. July–September. Common on dry hills and in woods and clearings. One of the most beautiful of the everlastings. Responsive to cultivation and useful in locations similar to its natural habitat.

GROUP NO. 4. WILD FLOWERS THAT REQUIRE MEDIACID OR INTENSELY ACID SOILS

Clintonia *Clintonia borealis* (BUY) 8–10 inches. Buff, sometimes with greenish tinge. Berries, dark metallic blue. Cool, moist upland woods. Plant in masses. Rather difficult to establish, but well worth the effort.

Dwarf Iris *Iris verna* (Sanctuary) (BUY) 4–8 inches. Violet-blue, yellow center. April–May. Frequent on wooded hillsides from Pennsylvania south. Thrives in mediacid soil regardless of other conditions, forming dense mats. Fine for the rock garden.

Moccasin Flower *Cypripedium acaule* (Sanctuary) (BUY) 8–12 inches. Crimson-pink. May–June. Authorities differ as to habitat. Gray says dry woods. I have found it in both dry and moist situations and in both sun and shade. Its chief requirement is evidently mediacid soil, and if this is provided, it is not difficult to establish, in either open or shaded locations, where the plants can be kept constantly moist. They should be given a light mulch of pine or hemlock needles during the first season.

Goldthread *Coptis trifolia* (BUY) 3–6 inches. White. May–July. This lustrous little evergreen covers large areas in woodland

CANADA MAYFLOWER AND PINK LADY'S SLIPPER
Maianthemum canadense and *Cypripedium acaule*

THE MAYFLOWER OR TRAILING ARBUTUS. *Epigæa repens*

bogs and shady pastures. Difficult to transplant, but makes a fine ground cover.

Pitcher Plant *Sarracenia purpurea* (Sanctuary) (BUY) 4–12 inches. Dark red. May–June. Plentiful locally in upland bogs. The closely allied species, *Sarracenia flava*, from the southern states, is entirely hardy. Both are invaluable in the bog garden.

Wood Sorrel *Oxalis acetosella* (Sanctuary) (BUY) 3–4 inches. White, with pink veins. May–July. Frequent in damp upland woods, preferably under hemlocks and oaks. Difficult to establish, but worth trying because of its dainty beauty.

Bunchberry *Cornus canadensis* (BUY) 3–8 inches. White. Berries vivid scarlet. May–June. Not infrequent in cool, damp, upland woods. This very dainty dwarf dogwood is one of the rather fastidious wildings that are difficult to establish in new locations unless careful attention is given to its requirements as to soil and exposure.

Trailing Arbutus *Epigæa repens* (Sanctuary) (BUY) Delicate pink. Fragrant. April–May. Formerly common in rocky woods and on wooded hillsides, particularly under or near cone-bearing evergreens. The arbutus has always been considered the loveliest flower of early spring. In New England it is known as the Mayflower. Unfor-

tunately its popularity and beauty have so attracted both thoughtless wild-flower lovers and commercial vandals that it has become extinct over areas of vast extent where it formerly carpeted the ground. It is now to be found in the wild, only in the more remote sections and if it is to be preserved from total extermination steps must be taken to give it protection and to propagate it. Under no circumstances should the arbutus be transplanted from the wild, as not one plant in a hundred will survive. Those who can provide congenial soil can succeed in establishing it if they buy potted plants from dealers who grow them from seed. They should be kept covered with a light mulch of pine or hemlock needles for the first season and care should be taken that the soil never dries out.

Twin-Flower (Sanctuary) (BUY) 6–18 inches. Crimson pink. Fragrant. June–August. Common in moist, mossy woods among the mountains. This delicate trailing vine does not take kindly to cultivation unless the conditions to which it is accustomed in its native haunts are closely approximated. It is worth the attempt to establish it, however, if a cool, moist corner and intensely acid leaf mold are available.

Linnæa borealis var. *americana*

COMMON POLYPODY (*Polypodium vulgare*)
Photo by E. Lawson-Scribner

LONG BEECH FERN (*Phegopteris polypodioides*)
Photo by E. T. Wherry

MAIDENHAIR FERN (*Adiantum pedatum*)
Photo by E. L. Crandall

CHAPTER VIII

Hardy Ferns of Eastern America

The wild ferns of our woods, swamps and pastures, besides serving a useful purpose as a protective and moisture-saving cover for the ground, have an esthetic value in the landscape that is not surpassed by any other class of low-growing plants. They are gregarious as a rule, and frequently carpet large areas with their graceful, waving fronds of varying shades of green. Many species, like the maidenhair, the dicksonia and the spinulose shield fern, are of such delicate and dainty form and texture that they produce effects that are nothing short of exquisite, whether grouped in masses by themselves, or combined with flowering plants of similar gracefulness and charm.

The absorbing and fascinating interest aroused by study of and intimate acquaintance with the ferns, often excites wonder among the uninitiated. Mrs. Parsons, in her book *How to Know the Ferns*, offers this explanation for their enlightenment. "To

some of us," she says, "the charm of ferns is as great, their beauty more subtle, than that of the flowering plants; and to learn to know them by name, to trace them to their homes and to observe their habits, is attended with an interest as keen, perhaps keener, than that which attends the study of the names, haunts and habits of the flowers."

Most ferns are easily transplanted and established in new locations, provided reasonable attention is given to their simple cultural requirements. They are in general, shade lovers, and with a few exceptions, do best in a constantly moist, but well-drained, circumneutral or moderately acid soil. The exceptions are kinds like the narrow-leaved chain fern (*Woodwardia areolata*) and the climbing fern (*Lygodium palmatum*), which require intensely acid soil, certain rock ferns that are found only in calcareous or alkaline soils, and a few species, notably the dicksonia and the rusty woodsia, which flourish in open sun.

The Christmas fern (*Polystichum acrostichoides*) and the spinulose shield fern (*Aspidium spinulosum*), while common everywhere, are collected in such enormous quantities for decorative use by florists that there is danger of their extermination unless measures are taken for their rational pro-

COMMON POLYPODY (*Polypodium vulgare*)
Photo by E. Lawson-Scribner

LONG BEECH FERN (*Phegopteris polypodioides*)
Photo by E. T. Wherry

MAIDENHAIR FERN (*Adiantum pedatum*)
Photo by E. L. Crandall

tection. The maidenhair fern (*Adiantum pedatum*), because of its singular and conspicuous grace and beauty, is also the victim of woodland wanderers, who far too frequently uproot it to use in house decorations or to plant it in home grounds without knowing or considering its needs as to soil, situation and care. It is recommended that plants of these three species, together with all the species that are extremely rare, be purchased from growers, if it is desired to use them in naturalistic plantings. The other kinds recommended for cultivation may be transplanted from their natural habitats or, if this is not convenient, may be obtained from dealers, many of whom offer a number of desirable hardy species in their catalogs.

My experience has been that ferns can be transplanted successfully any time during the growing season, though either early spring or late fall are usually considered best. It is really a matter of disturbing the roots as little as possible and keeping them moist and protected from the air and sun until the plants are established in their new homes. One great advantage in digging ferns during July and August is that they are then at their mature height and it is easy to arrange them intelligently and with regard to artistic effects. Should the rather fragile fronds be broken in

the process of moving, new ones will usually grow quickly. In any event, the following year the plant will show no evidence of injury.

My method of handling ferns taken from the woods at any season, is to lift the roots carefully, wash off the soil in the nearest brook or pool, and wrap them, first with a layer of thin sheet moss, taken from some fallen log or the sloping sides of a boulder, then with two thicknesses of newspaper. The moss is dipped in water and squeezed until it is barely moist. A surprising number of plants, thus treated, can be packed without injury to roots or fronds, in an ordinary market basket; and when unpacked they are invariably in prime condition for planting. Indeed, I have occasionally, for lack of time, been compelled to put off planting a newly-gathered basketful for as long as three weeks, but the ferns have always come out as fresh apparently as when they were dug. Incidently, this method of handling ferns is equally satisfactory with flowering plants of moderate size. It is, of course, impractical with such enormously rooted ferns as the osmundas, or with mature specimens of Goldie's fern and other kinds that develop fronds four feet long or more. Nothing smaller than a wheelbarrow will answer for the safe transportation of these giants.

In the general list of ferns which follows, mention is made of one or more easily observed and distinctive characteristics of each species. This, in connection with the accompanying illustrations, will help materially in their identification in the wild, by those who are not familiar with their names, aspects and habits of growth. Other details of cultural value are also given, such as height, soil preferences, and in some instances special directions for planting. Attention is directed to the importance of setting the roots, or crowns, as nearly as possible in accordance with instructions.

Special lists of suitable ferns will be found in the chapters devoted to woodland plantings, wild flower sanctuaries, field and meadow plantings, rock gardens and bog gardens.

Those who desire fuller information about the ferns than it is possible to give in these pages, are advised to get Prof. Willard N. Clute's *Our Ferns in Their Haunts* or Mrs. Frances Theodora Parsons' *How to Know the Ferns*. Both books are written in simple, non-technical language, and the information they contain is complete and reliable, except as to cultural treatment, a subject to which neither book refers, except in the most casual manner.

The nomenclature adopted for the botanical names is that of Gray's *Manual of Botany*, 7th Edition, as the authority most commonly consulted by students of wild life. The popular names in most cases are those agreed upon by all authorities. In a few instances choice has been made of the name that seems to be most appropriate.

Ferns have a botanical terminology which differs essentially from that of other plants. As, for the sake of brevity and accuracy, I have used a few distinctively fern terms, definitions explaining their meaning will be of interest to the uninformed.

Frond.—A fern leaf. *Fronds* may be simple (entire), like those of the walking-leaf fern; or compound (divided into leaflets) like those of the Christmas fern and the royal fern.

Pinna.—One of the leaflets of a compound *frond*. The plural is *pinnæ*. Many fern *fronds* are doubly compound; that is the leaflets are again divided into smaller leaflets. Those of some species, mostly outside of our range, are triply compound.

Pinnule.—One of the leaflets of a twice or thrice divided compound *frond*.

Pinnate.—A *frond* once divided into leaflets is *pinnate;* if twice divided it is *bi-pinnate*.

Pinnatifid.—Partially divided, in a *pinnate*

manner, but with leaflets not entirely separate.

Examples.—The *fronds* of the Christmas fern (*Polystichum acrostichoides*) are *pinnate.* Those of the lady fern, *Asplenium filix-femina*) are bi-pinnate. The common polypody (*Polypodium vulgare*) has a simple, but deeply *pinnatifid frond;* that is, it is deeply cut but not quite enough to form separate leaflets, or *pinnæ.* The spinulose shield fern (*Aspidium spinulosum*) is *bi-pinnate,* but the *pinnules* are so deeply *pinnatifid* that they are nearly *tri-pinnate.*

Spore.—The fruit of a fern, corresponding in function to a seed, but nevertheless not a seed. The complicated process which precedes the birth of a fern is one of the most interesting wonders of Nature. (See Prof. Clute's *Our Ferns in Their Haunts,* page 16). It takes from three to seven years from the time a spore germinates before the fern reaches maturity.

Fruit-dot.—A variously shaped mass of *spores,* appearing on the under sides of the fertile *fronds* of all the ferns listed here, except the *osmundas,* the *onocleas* and the *botrychiums* (q. v.). The size, shape and position of the fruit-dots on the *pinnæ* or *pinnules,* is a simple means of determining the identity of most fern species.

Common Polypody *Polypodium vulgare*

The smooth, leathery evergreen fronds of the polypody, grow to a height of 4 to 15 inches from creeping and branching rootstocks. They are simple in form, but so deeply pinnatifid as to appear once pinnate. The round, notably large, brown fruit-dots are located *midway* between the mid-rib and the margin of the segments. The polypody grows in dense, matted communities, forming a bright green blanket-covering for the cliffs and rocks which it frequents. It is abundant everywhere in rocky woods and on shaded hillsides and is in the circumneutral class as regards soil preferences, appearing to thrive equally well on limestone and non-calcareous rocks and soils. If cut into sods, it is not difficult to establish in new locations on rocky surfaces, on stumps or logs, or even in ordinary soil as an edging to a fern plantation. The sods should be pressed down firmly and kept continuously moist until the roots take hold. A thin layer of rich soil under the sods will help.

Thoreau found it very pleasant and cheerful in autumn to come upon a patch of polypody "on some rocky hillside where, in the midst of dry and rustling leaves, defying frost, it stands so freshly green and full of life."

The Long Beech Fern *Phegopteris polypodioides*

This handsome fern has bright green triangular fronds, 4 to 10 inches in length, which are much longer than broad. Its wiry, branching roots creep just below the surface for considerable distances in every direction. The fronds of this and the next species appear, at a casual glance, to be bi-pinnate; in reality they are twice pinnatifid, showing the close relationship of this fern to the polypody. A very noticeable peculiarity is the forward drooping of the lowest pair of pinnæ. The fruit dots are small, round, and placed *near the margins* of the segments. Gray assigns the long beech fern to damp woods, but I have found it much oftener on moist, even dripping rocks and cliffs, sometimes fully exposed to the sun. Professor Clute's experience has evidently been the same, for he writes: "To find the beech fern in its greatest luxuriance, the collector must visit the cliffs and ravines where dripping ledges provide dwelling places to its liking." Again he says it "is seldom found except in the vicinity of rocks." The long beech fern is an excellent subject for transplanting and is fine for ground cover purposes or in the rock garden. It is indifferent as to soil, but care should be taken to cover the roots very lightly and to keep the ground moist by mulching with dead

leaves until the plants are well established. It spreads rapidly and will soon form good sized clumps in congenial situations.

The Broad Beech Fern *Phegopteris hexagonoptera*

While there is sometimes a close resemblance between forms of this species and the preceding one, several marked differences will be found upon close examination and comparison. The broad beech fern, as its name applies, is much broader than long, its breadth ranging from 6 to 12 inches; the lowest pair of pinnæ are noticeably larger and longer than the pair above and do not droop. Its habitat is deep shady woods, preferably in dryish, circumneutral soil. It has no affinity for rocks. Its root system is like that of the long beech fern and the fruit-dots are similar in size and form and similarly placed. It thrives even better than the long beech fern under the same cultural treatment and seems to me considerably more attractive in mass plantings.

The Oak Fern *Phegopteris dryopteris*

One of the most delicately beautiful members of the fern family. The fronds are triangle-shaped and are composed of three triangular divisions, all of which are once or twice-pinnate, giving it the appearance of a miniature bracken. It rarely exceeds 6 to 8 inches in height. The rootstock is creeping and

MAIDENHAIR SPLEENWORT AND SEDUM
Photo by C. R. Shoemaker

BRACKEN (*Pteris aquilina*)
Photo by Paul Bartsch

COMMON CHAIN FERN (*Woodwardia virginica*)
Photo by Paul Bartsch

In shady swamps the fronds of this fern bend outward in all directions; if in a sunny locality, however, they all stand erect and face to the south.

sends up new fronds constantly during the growing season. The fruit-dots are inconspicuous and located *near* the margins of the segments. The oak fern is rather uncommon, in moist, rocky woods, and does well in cultivation in similar situations regardless of soil reaction. It should be given the same culture and care as the long beech fern.

The Maidenhair Fern
Adiantum pedatum

I have so often had the early rue, the meadow rue, the baneberries and the columbine pointed out as maidenhair ferns by chance companions on woodland strolls, that perhaps it is well to give a brief outline of the characteristics of this supposedly generally known plant. The black, shining stem of the maidenhair is divided at the summit into two curving branches, from the outer side of which spring the pinnæ. The latter are again divided into pinnules, so the frond is bi-pinnate. The fruit-dots are either oblong or shaped like a half moon and are located along the outer edges of the pinnules which are rolled back to form a protecting cover. The black, wiry, creeping roots lie right at the surface. They branch freely and produce fresh fronds continuously. The height of the fronds at maturity ranges from 8 to 20 inches. The maidenhair is a circumneutral soil plant, and is found rather abun-

dantly in moist, rich woods under deciduous trees, *other than oaks*. If the roots are *lightly* covered with leaf mold that is not of *marked* acidity, the plants are easy to establish and grow, provided the ground is kept fairly moist and continuously mulched.

The Bracken *Pteris aquilina* The common brake or bracken is probably the most abundant of the ferns in this country. While it is most luxuriant in thickets, it grows freely in both shade and sun, on barren hillsides, in pastures and along roadsides everywhere. It is classed as a moderately acid soil plant. The dull green fronds grow from 8 inches to 3 feet high, at the summit of an erect, stout stem, which branches into three bi-pinnate divisions having a spread equal to the height of the plant. The rootstock is as thick or thicker than a lead pencil and creeps for long distances, deep in the earth. It sends up fronds at intervals of 6 inches or more all summer long. The fruit-dots are in a continuous line along the margin of the pinnules and are covered by the reflexed edges. The bracken, because of its long, deep roots, is difficult to move successfully. The best plan is to take young plants as early in spring as possible and with as much root as can be grubbed up intact, and reset them quickly, taking special care to keep the ground con-

NARROW CHAIN FERN (*Woodwardia areolata*)
Photo by C. R. Shoemaker

The illustration shows both sterile and fertile fronds, the former having broad pinnæ like those of the sensitive fern, the latter much taller and with noticeably narrow pinnæ.

EBONY SPLEENWORT (*Asplenium platyneuron*)
Photo by Paul Bartsch

"There be empiricks of this age who teach that with this herbe not only the hardness and swelling of the spleene, but all the infirmities of the liver, also, may be effectually removed."—GERARD.

stantly moist until they have become established. It is equally difficult to keep a colony of bracken within bounds, or to root it out, once it has taken possession of a new location.

The Cliff Brake *Pellæa atropurpurea*

The cliff or winter brake is a gem for the rock garden, because of its striking beauty, its ability to thrive in dry, even sunny situations, and its easily satisfied soil preferences. Growing most frequently on limestone, it is also found on other kinds of rocks and in soil of moderate acidity. It is therefore classed as a circumneutral soil plant. It is a somewhat rare species, but may be obtained from dealers and as it becomes much bushier and handsomer under cultivation, the best plan is to buy it. The cliff brake is attractive both in its unique aspect and in its distinctive coloring. The leathery evergreen fronds grow from 4 to 20 inches in length, and are decidedly unconventional in their divisions, some being simply pinnate, some bi-pinnate, some both pinnate and bi-pinnate, while even the pinnæ may be entire, pinnate or pinnatifid, with little regard to their position. The color of the fronds is bluish gray-green, with dark, shining, purplish-brown stems. The fruiting fronds are much taller than the sterile with narrower pinnæ,

or pinnules, due to the reflexed margin covering the fruit-dots, as in the bracken. The rootstock is short and creeping and in cultivation should be barely covered with soil. A light mulch is essential until the plants are established. The harebell (*Campanula rotundifolia*) and the columbine (*Aquilegia canadensis*) are fitting companions for the cliff brake.

Common Chain Fern
Woodwardia virginica

If one is fortunate enough to discover a colony of the chain fern in a convenient location, it will be found a very acceptable substitute for the much more abundant cinnamon fern (*Osmunda cinnamomea*) which it resembles superficially. The chain fern has a creeping rootstock the size of a lead pencil which lifts easily from the ooze in which it grows, while the root of the cinnamon fern is so large and takes such tenacious hold that a crowbar is not too powerful an aid in prying it loose. The fronds of the chain fern are produced at intervals along its roots all summer long. They reach a height of from two to even five feet and are once pinnate with deeply pinnatifid pinnæ. The fruit-dots are oblong and are arranged in parallel lines, like the links of a chain, along the mid-ribs of both the pinnæ and the pinnule-like segments. The chain fern is found in wet

swamps and is most abundant near the coast. In cultivation, it may be classed as a subacid soil plant, which thrives in wet or only moderately moist situations and looks best planted in large colonies.

Narrow-leaved Chain Fern
Woodwardia areolata

The statement in the fern books that this chain fern resembles the very common sensitive fern (*Onoclea sensibilis*), led me to waste many hours, in my early fern hunting days, in fruitless examination and study of the latter. I discovered later that the narrow-chain fern is as rare as the other is abundant and that they do not fraternize. Its usual companion, as Professor Clute says, is the Massachusetts fern (*Aspidium simulatum*), and its natural habitat is in wet soil under coniferous evergreens, and near the coast. As both *Woodwardia areolata* and *Aspidium simulatum* belong in the *mediacid*, or intensely acid soil class, their apparent affinity and their choice of habitat are clearly explained. *Woodwardia areolata* is called *Woodwardia angustifolia* in most books and articles on ferns, and is so listed by dealers. Because of its scarcity, it should be purchased and not taken from the wild. The sterile fronds of the narrow chain fern grow from two to twenty-four inches high, from slender, creeping rootstocks, and are so deeply pinnatifid as

to appear pinnate. The fertile fronds are much taller and differ both in form and color, the pinnules being very narrow and of a darker green. The stems are black and shining. The chain-like fruit-dots are in parallel rows, one row on each side of the mid-rib of the pinnules. *Woodwardia areolata* is a handsome fern in all its stages and easy of cultivation in favorable locations. It will not persist long, however, unless the soil is very acid. The roots should not be covered more than half an inch and the mulch should consist of half rotted hemlock or pine needles. Congenial companion plants are the climbing fern (*Lygodium palmatum*); goldthread (*Coptis trifolia*); the wood sorrel (*Oxalis acetosella*); the bunchberry (*Cornus canadensis*); the twin flower (*Linnæa borealis*); the trailing arbutus (*Epigæa repens*) and the pitcher plant (*Sarracenia purpurea*)—the latter, of course, in close-by boggy spots, where sphagnum moss is present.

Maidenhair Spleenwort
Asplenium trichomanes

No plant is more attractive in the shaded rock garden than this dainty little spleenwort. It forms dense, bright, evergreen tufts, of from ten to twenty-five fronds each, which vary in length from four or five to eight inches, and spring from a small, black, tufted rootstock, with thread-like rootlets. The

NARROW-LEAVED SPLEENWORT (*Asplenium angustifolium*)
Photo by Paul Bartsch

The narrow-leaved spleenwort shows a marked preference for wet places in open woods. It is therefore sometimes called the swamp spleenwort. Another local name for it is the kidney fern.

SILVERY SPLEENWORT (*Asplenium thelypteroides*)
Photo by Paul Bartsch

The name *Asplenium* is from the Greek and means without a spleen. It was once believed that cattle which fed upon spleenworts, lost their spleens.

frond is once-pinnate and the tiny oblong fruit-dots are placed at an angle with the midrib of the pinnæ. The stem is a shining dark brown. The maidenhair spleenwort grows naturally in the shaded crevices and chinks of rocks and cliffs and in rather dry soil. It is never far from water, however, and I have an idea it depends largely for moisture upon a humid atmosphere. It belongs in the circumneutral soil class and is therefore easily established. I suggest that plants should be purchased, because of the difficulty of prying it loose from its natural home with roots intact. Dealers supply pot-grown plants, with well-developed root systems, and these grow luxuriously and spread rapidly. The most appropriate companions of the maidenhair spleenwort are the walking leaf fern (*Camptosorus rhizophyllus*) and the harebell (*Campanula rotundifolia*).

The Ebony Spleenwort
Asplenium platyneuron

In spite of its relatively tall and somewhat rigid fertile fronds this close relative of the maidenhair spleenwort has a certain delicate grace and beauty that is entirely distinctive. I should call it a stone rather than a rock-loving species, as it is most frequently found growing in poor soil, made up largely of stone or shale fragments, as at the base of cliffs, on the upper edges of gravelly

banks, on shaly slopes and particularly on the thin layers of dirt that have accumulated on the *tops* of cliffs and rock outcrops. Occasionally, however, it strays into the shady woods and shows its liking for good food, by flourishing luxuriantly in the moist, black leaf mold it finds there. It is clearly indifferent as regards exposure, thriving contentedly in deep shade, partial shade, or full sun, in poor soil or rich, moist or dry, according to location. The sterile fronds grow in tufts from a small rootstock, are pinnate and from 3 to 6 inches long. The plant closely resembles the maidenhair spleenwort when the fertile fronds are absent. The latter reach a height of from ten to twenty inches and carry the abundant curved fruit-dots in a double row, nearer the mid-rib than the margin of the pinnules. The stems of both sterile and fertile fronds are dark, shining brown in color, giving the fern its common name. In cultivation the ebony spleenwort quickly adapts itself to any situation in which it may be placed, but it is most effective in the sunny or half-shaded rock garden. It is easily transplanted and requires no special treatment. Fine companion plants are the early saxifrage (*S. virginica*), the columbine (*Aquilegia canadensis*), the rock pink (*Silene pennsylvanica*) and the white and lavender varieties of *Phlox*

EVERGREEN WOOD FERN (*Aspidium marginale*)
Photo by C. R. Shoemaker

"What means this persistent vitality? . . . They fall back and droop here and there like the plumes of departing summer, of the departing year. Even in them I feel an argument for immortality."

—THOREAU.

GOLDIE'S FERN (*Aspidium Goldianum*)
Photo by Paul Bartsch

THE NEW YORK FERN (*Aspidium noveboracense*)
Photo by Paul Bartsch

subulata. The ebony spleenwort is usually listed by dealers as *Asplenium ebeneum*.

The Narrow-leaved Spleenwort *Asplenium angustifolium*

The deep rich woods is the chosen home of this rather rare, but stately fern. Its greatest beauty to me is the simplicity of its once-pinnate frond and wavy undivided pinnæ, which are much narrower in the fertile than in the sterile fronds. The fronds are from two to four feet high and do not reach maturity until late summer. They grow from an easily lifted, creeping rootstock. The fertile fronds are taller than the sterile and carry the narrow, slightly curved fruit-dots in a double row along the mid-veins of the pinnæ. The narrow-leaved spleenwort belongs in the circumneutral soil class and thrives under the same cultural treatment as that recommended for the maidenhair (*Adiantum pedatum*), its frequent neighbor in the wild. It also combines harmoniously with the two baneberries (*Actæa*) when in fruit, with the white snakeroot (*Eupatorium urticæfolium*) and with the two lobelias (*L. cardinalis* and *L. syphilitica*).

The Silvery Spleenwort *Asplenium acrostichoides*

The distinguishing characteristic of this thrifty but not specially striking species, is the silvery white covering of its fruit-dots which persists well into the summer

months and is pleasing to the eye when displayed by a passing breeze. The fruit-dots alternate on each side and are set at an oblique angle to the mid-ribs of the pinnules. It has a superficial resemblance to the New York fern (*Aspidium noveboracense*) and, like that fern, grows in extensive clumps. The pale green fronds taper both ways from the middle, are from 2 to 3½ feet high, and are pinnate, with the pinnæ deeply pinnatifid. The rootstock is rather thick and creeps horizontally near the surface, making the plant an easy one to move. It grows in the wild in rich moist woods, in company with the trilliums, trout lilies (*Erythronium*), false spikenard (*Smilacina racemosa*) and the common blue violet (*Viola papilionacea*). It does not occur frequently enough to be classed as common: abundant locally, is probably the better way to put it. The silvery spleenwort is indifferent as regards acidity in the soil and does well in cultivation in almost any moist, shaded location, if the creeping roots are not covered too deeply. It is usually listed in dealers' catalogs as *Asplenium thelypteroides*.

The Lady Fern
Asplenium filix-femina

The ubiquitous lady fern seems to dispute with the hay-scented fern (*Dicksonia*), possession of likely locations everywhere. Regardless

of soil, exposure and moisture, it carpets large areas in the depths of forests, forms thrifty clumps in open swamps and stony pastures, and grows in endless profusion along country roads, heedless of the clouds of dust with which it is sprinkled by passing vehicles. It is extremely variable in form, often closely resembling the dicksonia. In such cases an examination of the fruit-dots is the easiest way to settle the matter. These, on the lady fern, are horseshoe-shaped when young, becoming straight later, and are placed about halfway between the mid-rib and the margins of the pinnules. On the dicksonia they are round, very small, and placed on the *margins* of the toothed segments of the pinnules. The most frequent form of the lady fern in the eastern states has bipinnate fronds with the pinnules deeply pinnatifid. The stems are often pink or wine-color in the spring, contrasting beautifully with the yellow-green pinnæ. The fronds grow in circles from a stout creeping rootstock and are sometimes over three feet high. In late summer this fern loses much of its freshness and assumes a rather rusty and dilapidated aspect. It transplants readily and will grow and spread rapidly in any moist soil. It is notably attractive in large masses, particularly during the spring and early summer

months. I like to associate it with the asters, golden-rods and other late-blooming wild flowers, that will help to obscure the faded and unkempt fronds which follow its maturity. Such groups are fine for distant underplantings in open woods and copses, or on moist, sunny, or half shaded banks. The roots should have a covering of half an inch of fairly rich soil,—the species is indifferent in this regard—and a mulch of any available litter should be maintained until they are established.

The Walking Leaf
Camptosorus rhizophyllus

I came to the conclusion years ago, after numerous experiments with this curious but neat and attractive evergreen fern, that its chief cultural requirement is dense, moist shade, if it is to reach its best and most vigorous development. If exposed to the sun, or even bright daylight, the fronds take on a yellowish hue and appear stunted in their development. It is certainly in the circumneutral soil class, and is distinctively a rock plant, although it sometimes spills over and takes possession of nearby mossy banks or rotting logs. It is abundant locally, but not at all common. In a deep, wooded ravine near Great Barrington, Mass., there is an enormous egg-shaped boulder, six feet high, by eight or ten feet in its longest diameter,

that is absolutely covered with the walking leaf. Yet, diligent search of the surrounding woods for a mile or more in all directions, has failed to discover even one other specimen. The most interesting characteristic of the walking leaf is the forming of new plants by the tips of the arching fronds, as a result of their taking root where they touch the ground. In outline, the leathery, blue-green fronds are heart-shaped at the base, entire, and taper to a long, slender tip. They grow in roundish tufts from a small rootstock and are from four to twelve inches long. The oblong fruit-dots are scattered irregularly on the back of the frond, most of them near the base.

Where, as often happens, the walking leaf grows in dense mats, as on the horizontal shelves of cliffs, the plants may be cut in sods like the polypody, and be given similar cultural treatment. Single plants, or small clumps, should be handled like the maidenhair spleenwort, which is a very acceptable companion. They should be planted in deeply shaded sections of the rock garden, or may be used as an edging under taller ferns in moist, rich loam. Dealers grow the walking leaf in pots and such plants are far more certain to succeed than those collected from the wild.

The Christmas Fern
Polystichum acrostichoides

This fern gets its popular name from the extensive use of its thick, evergreen fronds for Christmas and other winter decorations. While it is one of the most abundant species in our eastern woods, it is being rapidly exterminated and I have included it in the list of ferns needing protection. It is catalogued by most dealers as *Aspidium acrostichoides*. The fronds of the Christmas fern grow in circular clumps from a crown at the end of a stout rootstock. When young, their color is a bright green which becomes much darker at maturity. They are once-pinnate and the fertile are noticeably taller than the sterile. The round fruit-dots are borne in two rows on the backs, of the upper pinnæ only, of fertile fronds and ultimately run into each other, covering the pinnæ completely with a rough brown coat. The fronds vary in height from eight inches to three feet. The Christmas fern is indifferent as to soil, and location, but in the wild, seems to prefer as a home, a rocky and shady hillside, either moist or dry. It is easy to dig the roots, which should be planted with the crown half exposed above the surface. Its most frequent companions in its forest haunts are hepaticas, trilliums, bloodroots, anemones and Solomon's seal. I prefer to

THE CRESTED FERN (*Aspidium cristatum*)
Photo by Paul Bartsch

The crested fern is a denizen of Europe and Asia as well as of this country. It makes its home along streams, sometimes in the open, but more frequently in thickets and deep woods.

SPINULOSE WOOD FERN (*Aspidium spinulosum*)
Photo by Paul Bartsch

The Indians of Alaska collect the young "fiddleheads" of this fern, bake them in pits lined with hot stones and eat them with relish. Thus prepared, they have a sweetish, smoky taste that seems to suit the aboriginal palate.

see it used in woodland plantings, in situations closely similar to those to which it is accustomed in its natural haunts.

Braun's Holly Fern
Polystichum braunii

This notably beautiful and decorative evergreen fern is called by many names. Dealers list it as *Aspidium aculeatum*, var. *Braunii* and another botanical name is "*Dryopteris Braunii*." A second popular name is the Prickly Shield Fern. For consistency's sake, I adopt the nomenclature of Gray's Manual. Except for occasional "stations" in the Catskills and in the mountains of Pennsylvania, Braun's holly fern is found only in the extreme northern sections of our range. It is rather common on shaded, rocky slopes and along mountain brooks in northern Maine, less frequent in upper New Hampshire and Vermont, and only occasional in the Adirondacks. The shining yellow-green fronds, from 18 to 30 inches long, are produced from the crown of a short thick rootstock. They are bi-pinnate and the pinnules are sharply toothed. All parts of the frond are densely clothed with hair-like growths and brown, chaffy scales. The fruit-dots are very small, round, and in single rows on either side and close to the mid-ribs of the pinnules. This is a circumneutral soil plant, which succeeds in any rich, moist,

shaded situation. It is fine used as an individual specimen, or in clumps of moderate extent and makes a handsome showing among massed plantings of the darker green Christmas fern (*Polystichum acrostichoides*) or the evergreen wood fern (*Aspidium marginale*). Plants should be purchased from dealers and should be planted so the crown shows above the surface.

The Marsh Fern
Aspidium thelypteris

In earliest spring, when the marsh marigold is just opening its golden blooms, the crosiers of the marsh fern, tiny green balls at the summits of long slender stems, may be seen in profuse abundance in the soft black ooze in which both plants delight. These first fronds are always sterile, the fruiting fronds delaying their appearance until July. They are both once-pinnate, with the pinnæ deeply pinnatifid, and grow from creeping, cord-like roots. The round fruit-dots are borne in double rows and spread, when ripe, so they completely cover the backs of the fertile pinnules. They are protected by the rolled-back margins, which characteristic makes the pinnules appear narrow and pointed, as compared with those of the sterile fronds. I have never found it difficult to transplant the marsh fern, or to establish it in appropriate situations. It is

common everywhere, seems to flourish in either subacid or circumneutral soil and is also indifferent as regards sun or shade, provided it is supplied with sufficient and constant moisture. As its preferred habitat is along streams and in marshy meadows, in open sun, it looks most natural in similar surroundings, with such neighbors as the blue flag (*Iris versicolor*) the closed gentian (*Gentiana andrewsii*) and the cardinal flower (*Lobelia cardinalis*). The roots should be covered lightly with not more than a half inch of rich mold.

The New York Fern *Aspidium noveboracense*

A very noticeable characteristic of the New York fern is the way the pinnæ of its pale green, delicate fronds diminish in size toward the base, until the lowest pair become so small as to be almost imperceptible. The pinnate fronds grow in tufts of three or more at intervals along a slender, creeping rootstock, reaching a height of 12 to 20 inches. The roundish little fruit-dots are in double rows near the margins of the deeply pinnatifid pinnæ. This common woodland fern is addicted to the dryish shade of deciduous trees, particularly of the maples, beeches and birches, and is found in both subacid and circumneutral soils, so it may be classed as indifferent in this regard. In the wild, it

forms extensive communities, growing so densely and with the roots so matted, that it is a simple matter to take it up in sods. The fronds become faded in late summer, but until this happens, no other ferns are so daintily beautiful in mass plantings. I have a long under-planting of the New York fern bordering a row of wild hydrangeas, which is enthusiastically admired by everyone who sees it. When planting individual specimens, the buds should be set just below the surface. Sods may be laid on previously cleared and prepared areas, pressed down gently, watered, and left to themselves.

The Evergreen Wood Fern *Aspidium marginale*

The two principal cultural requisites of the evergreen wood fern appear to me to be deep shade and the near proximity of rocks or stones. It is so indifferent as regards soil that it grows with equal vigor in circumneutral and subacid kinds, and I also find it frequently in mediacid locations, as in pine and hemlock groves, where it seems perfectly at home. It is abundant everywhere on rocky hillsides and banks, and in the larger recesses of cliffs; and is particularly happy when nestled between the buttressed roots of large trees. I admire this fern for its symmetry as well as for its rich, dark, blue-green color. Its handsome bi-pinnate fronds

SPINULOSE WOOD FERN—MOUNTAIN FORM
(*Aspidium spinulosum*, var. *dilatatum*)

BOULDER FERN (*Dicksonia punctilobula*)
Photo by E. L. Crandall

BULBIFEROUS FERN (*Cystopteris bulbifera*)

"Mark ye the ferns that clothe that dripping rock
The crosier-headed ferns, most fresh and rare,
Their hairlike stalks, though trembling neath the shock
Of falling spraydrops, rooted firmly there."

are leathery in texture and grow to a height of 12 to 30 inches, from a large, chaff-covered crown which protrudes an inch or more above the ground. The round fruit-dots are conspicuously large and are placed on the very edges of the pinnules, a characteristic which makes it easy to identify this fern at first sight. The evergreen wood fern is an excellent companion for the spinulose wood fern (*Aspidium spinulosum*) in underplantings, where striking color contrasts are desired. In fact a mass planting of these two species as a ground cover under tall coniferous evergreens cannot be surpassed for beauty and fitness. Solomon's seal (*Polygonatum biflorum*), false spikenard (*Smilacina racemosa*) and the wood lily (*Lilium philadelphicum*) are striking additions to such groups. When planting the evergreen wood fern, the crown should be set as it is in the wild, only partially covered. It is a simple task to locate and lift this fern and no difficulty will be found in establishing it, if the location is shady and the soil moist, and rich. It may be used singly, in clumps or in masses, and the effect is always pleasing. The natural associates of individual plants are hepaticas, columbines, early rue, trilliums, jack-in-the-pulpits, the wood anemones, the bellworts, and, for good measure, the yellow lady's slipper.

The Male Fern *Aspidium filix-mas*

At first glance this species looks very like the evergreen wood fern, but there are several noticeable differences. The male fern is considerably lighter in color, is not evergreen, and the much smaller fruit-dots are near the mid-ribs of the pinnules instead of on their margins. The fronds grown from 12 inches to 3 feet long and are produced in circles from the crowns of knotted rootstocks. It is necessary to go to Canada or to the far northwest to find the male fern growing wild, although it has been reported from northern Vermont. Plants may, however, be obtained from dealers and these are sure to thrive if planted in circumneutral soils, in shade. The male fern is a pleasing addition to any woodland planting of ferns and looks best when grouped with the Christmas fern or the evergreen wood fern. It should be given the same cultural treatment as the latter.

Goldie's Fern *Aspidium goldianum*

This magnificent species is not only the tallest of the wood ferns but, in favored locations, its fronds reach a height that is approached only by the most vigorous of ostrich and cinnamon ferns. I found several specimens in a deep densely shaded swamp, in Westchester County, N. Y., with fronds exceeding 6 feet in length by well over a foot in breadth

at their widest point! Incidentally, this "station," which was within 400 feet of my home, is the only one I have ever personally discovered during many years of exploration in the woods and fields of New York and New England. I am therefore in full agreement with Professor Clute's statement that "it is not generally distributed in its range, and is often rare and missing over large stretches of country." Those who wish to enjoy the stately beauty of this unusual fern, should by all means buy the plants from dealers. Aside from its generous proportions, the distinctive marks of Goldie's fern are its peculiar blue-green color, its nearly twice-pinnate fronds and the position of its large round fruit-dots, on or very close to the mid-ribs of the pinnules. The fronds grow from the crown of a thick, horizontal rootstock which takes such slight hold of the loose, black mold that the plant, despite its size, can be easily lifted with the hands from the spot in which it grows, I have planted Goldie's fern in many combinations with other plants and in many locations, but I think it shows to best advantage in marshy, but well-drained situations, in deep shade, where it can be grouped with the royal fern (*Osmunda regalis*) and have as more colorful associates, the meadow rue (*Thalictrum polygamum*), the Turk's cap

lily (*Lilium superbum*), the golden ragwort (*Senecio aureus*) and, if obtainable, the superb showy lady's slipper (*Cypripedium hirsutum*).

Goldie's fern belongs in the circumneutral soil class and, in the right location, requires little cultural attention. The conspicuous crowns should be kept above the surface, when planting.

The Crested Fern
Aspidium Cristatum

Should the wanderer through some wooded swamp or low, boggy meadow encounter a tall, slender fern, with its pinnæ turned so their surfaces are horizontal, "like the open slats of a blind," as Clute puts it, he can be certain he has found the crested fern, for all other members of the tribe carry their pinnæ vertically. This fern, however, has other distinguishing features. One is the pronounced triangular shape of the lower pinnæ and another is the marked difference between the fertile and the sterile fronds, the former being very much taller and perishing in autumn, while the latter persist during the winter. The fruit-dots are in rows midway between the mid-rib and margins of the divisions of the pinnæ. The frond is once-pinnate and grows from the crown of a medium sized, creeping rootstock, which is easy to dig. There is a form of the crested fern known as Clinton's fern (*Aspidium*

OSTRICH FERN (*Onoclea struthiopteris*)
Photo by A. S. Hitchcock

"The feathery fern, the feathery fern,
It groweth wild, and it groweth free,
By the rippling brook and the wimpling burn
And the tall and stately forest tree."—ANON.

THE INTERRUPTED FERN—STERILE FRONDS
(*Osmunda claytoniana*)
Photo by Paul Bartsch

THE RARE CLIMBING FERN (*Lygodium palmatum*)
Photo by C. R. Shoemaker

cristatum, var. *clintonianum*) which has fronds very much larger in every way. They sometimes reach a length of over four feet, as compared with half that length as the maximum for the type. Both kinds are desirable in the composition of woodland and bog plantings and are easy to grow in either subacid or circumneutral soil. The plants, which may be obtained from dealers, should be set so the crown shows above the surface. I like these ferns best in the moist spots of low meadows, with the meadow lily (*Lilium canadense*), grass-of-parnassus (*Parnassia caroliniana*) and the purple fringed orchid (*Habenaria psycodes*) as boon companions.

The Spinulose Wood Fern
Aspidium spinulosum

This species is best known by its two varieties—*intermedium* and *dilatatum*—the type being infrequent in our eastern woods. *Intermedium* is the commoner form, *dilatatum* the handsomer. The fronds of the latter variety are much broader than those of *intermedium* and have a distinctive feature that is a sure means of identification, in the extraordinary length of the pinnules on the lower sides of the bottom pair of pinnæ. These are three and sometimes four times as long as the upper pinnules. The natural haunts of both forms are in deep, moist, rocky woods, but *dilatatum* prefers higher

altitudes and is much more abundant among the mountains. The lace-like fronds of the spinulose fern are nearly three times pinnate and the smallest divisions are again incised, with tiny spines at the tips of the teeth. They grow in circles from the crowns of the stout rootstocks to a height of from 1 to 3 feet and curve outwardly in graceful arches. The color is a rich, bright green. The tiny fruit-dots are usually halfway between the mid-rib and margins of the pinnules. The indifference of this species as regards soil, makes its culture a simple process. Classed as thriving in both circumneutral and subacid soils, it is not averse to the mediacid mold of pine and hemlock groves, where it frequently establishes itself in large, dense colonies of exceptional beauty. It is at its best in such situations but is also charming among boulders, on rocky banks and in moist, shady spots anywhere. It should be given the same cultural treatment as the evergreen wood fern.

The Bulbiferous Bladder Fern
Cystopteris bulbifera

The long tapering fronds of this graceful and decorative fern and its unique method of insuring quick propagation by means of bulblets developed on many of its mature fronds, are two unmistakable indicators of its identity. Its favorite habitat is reported by several authorities as

shaded, dripping cliffs, especially in limestone regions, but I have also found it in abundance on shady hillsides, river banks and even in open pastures on the north side of boulders. In none of these locations is there excessive moisture or any evidence of limestone. As cultural tests place it in the circumneutral soil class, I am sure that lime is not essential to its growth, and that it will thrive vigorously in any moderately moist situation, if shaded. The bi-pinnate, light green fronds of this species grow from slender, creeping rootstocks to a length ordinarily of from 1 to 2 feet, though specimens 4 feet long have been found. The pinnules are deeply toothed, or pinnatifid, and the tiny, roundish fruit-dots are located at the base of each tooth. The bulblets are produced irregularly on the under surfaces of the pinnæ and contain embryo fronds. When mature they drop to the ground and soon take root, developing into full fledged ferns much more quickly than is possible by the complex spore, or fruit-dot, process. The almost vine-like habit of the bulbiferous bladder fern makes it admirable for covering purposes either in shaded portions of the rock garden or in any place where the slender curving fronds can droop or sprawl at will. If planted in clumps, set the plants a foot apart with

the crown just at the surface. Mulch until they are established. This species is irregularly distributed, is abundant in some localities and entirely absent in others where conditions seem equally favorable. It is probably the better course to buy the plants.

The Fragile Bladder Fern *Cystopteris fragilis*

There is no truer green in nature than the bright emerald of the young fronds of this slender, graceful and delicately cut fern. It is the first of the tribe to show its colors in early spring and even in late November, during periods of relative warmth, it sends up slender shoots which adorn the rocks and banks it frequents with fresh greenery when all the surroundings are sere and brown. Indeed, its frequent recrudescence during the growing season, is its most admirable characteristic. Its fronds mature rapidly, and soon afterward turn yellow and wither. Often in July, particularly during dry weather, the plant entirely disappears. Then comes a gentle, soaking rain and there it is again, in all its fresh beauty, seemingly having sprung up, like Job's gourd, almost in a single night. This may happen several times before the frost and snow locks it in its winter prison. The fragile bladder fern grows to a height of 6 to 18 inches, though 2 feet is not uncommon. Its fronds spring

THE ROYAL FERN (*Osmunda regalis*)

UNCOILING FRONDS OF THE CINNAMON FERN
Photo by E. L. Crandall

from the crowns of slender rootstocks and are in large part bi-pinnate, with toothed pinnules on the backs of which the tiny round fruit-dots are rather thickly scattered. It belongs in the circumneutral soil class, and is satisfied with the moisture afforded by the usual summer rains. Its superficial resemblance to the obtuse woodsia should not be much of a puzzle if its pointed widely separated pinnæ and inconspicuous fruit-dots are compared with the broader, blunted divisions, the denser habit and the larger, star-shaped fruit-dots of the woodsia. The fragile fern should be planted with the crown just at the surface and a light mulch should be provided for the roots. It is certain to thrive in shady, well-drained soil and soon forms charming little tufts. It is fine for the rock garden, or for covering shady banks and knolls and is particularly attractive when combined with other ferns of delicate texture and low-growing, graceful wild flowers.

The Rusty Woodsia
Woodsia ilvensis

This odd, but at times extremely attractive fern, shuns the cool forest reaches and the companionship of its shade-loving kin and gathers in clumps and colonies on the exposed summits of hills and ridges. It seems to delight in establishing itself on the very edges of steep cliffs where, with the

early saxifrage and various lichens, it basks in the sunshine or braves the storm, making the best of the meager soil which prevails in such locations. The common name well describes the appearance of its fully developed fronds, which are covered underneath with wooly hairs that turn a rusty brown color at maturity and are so dense as to almost hide the star-shaped fruit-dots. The upper surfaces of the older fronds, however, are dark green and as new ones are constantly growing on which, while young, the hairs are silvery white, a picture of contrasting colors is presented that is very pleasing. When a mature frond perishes it leaves behind it an inch or two of stem and these stems form a bunch of stubble that is a noticeable characteristic of the species. The rusty woodsia is once-pinnate with the pinnæ deeply pinnatifid. The rootstocks are thick and a number of them are usually matted together, so they can be dug in chunks. It is a circumneutral soil plant, requiring little moisture, and is ideal for the sunny rock garden, among the sedums, the creeping phloxes and the bird-foot violets. Care should be taken when planting to see that the upper portion of the crown is not covered. While abundant locally, this fern is anything but common, and many hard climbs and fruitless searches will

be avoided by ordering plants from dealers.

The Obtuse Woodsia
Woodsia obtusa

On the ledges of cliffs, on shady banks and among loose stones in any shaded locality, one may expect to find the obtuse woodsia. Clute intimates that it sometimes grows in the sun, when it "takes on a yellow green color and becomes thicker and more erect." It is sometimes confused with the fragile bladder fern (*Cystopteris fragilis*) but there is little difficulty in distinguishing the differences (see page 259). The sterile fronds of the obtuse woodsia are nearly if not entirely evergreen. In late summer they bend over and form an arching tuft, leaving the fertile fronds erect in the center. Both kinds of fronds are pinnate, with such deeply pinnatifid pinnæ that they are almost bi-pinnate. They grow from 6 to 18 inches long and are of a rich, green color—not so bright, however, as those of the fragile bladder fern. I am fond of growing these two species side by side, as in many respects they complement each other. They also have the same soil preferences and should be given similar cultural treatment.

The Boulder Fern
Dicksonia punctilobula

The dicksonia, as I prefer to call it, is a very democrat among ferns. It fraternizes alike with its aristocratic and exclusive kin

of the wildwood and with its sturdier relatives, the osmundas and ostrich ferns of the swamps and meadows. It shares with the lady fern the dusty waysides and the shelter of stone walls and finally, climbing the hill or mountain side, it clusters around the boulders and half buried rocks of upland pastures and spreads its waving fronds in dense communities over vast areas of the landscape. Where it takes up its habitation it is a decoratively beautiful feature of the scenery. The bright green fronds spring from extensively branching and creeping rootstocks and bend in every direction, forming dense clumps, often 25 to 30 inches high. They are bi-pinnate and the pinnæ are again deeply cut into toothed segments, giving the plant a lace-like appearance as marked as that of the spinulose fern (*Aspidium spinulosum*). The round fruit-dots are inconspicuous and are placed at the base of the segments. The dicksonia is one of the commonest and most abundant of the ferns and is well suited for cultivation. Absolutely indifferent as regards soil, moisture or exposure, there are few localities, where a billowy, green cover plant is desired, in which it does not look entirely appropriate, harmonious and altogether lovely. It has many local or popular names, such as the gossamer fern, the mountain fern and, more

commonly, the hay-scented fern, from the fragrance of its mature or fading fronds when crushed. Like the New York fern (*Aspidium noveboracense*), it may be lifted from the wild in sods and given similar cultural treatment. It is also sold by dealers, singly, or by the square foot.

The Sensitive Fern
Onoclea sensibilis

The pinkish-bronze croziers of the sensitive fern appear in countless numbers during late April and early May in moist places everywhere. This species reaches its greatest development in low woods and shaded swamps, where its fronds are often 2 feet high and of equal spread. In open sunny places, however, as in meadows and along the wet borders of streams and ponds, its height rarely exceeds 12 inches and as a rule is not over 6 inches. It is an extremely gregarious fern, forming dense and extensive communities; and is of such vigorous and aggressive growth that few other plants have the temerity to dispute possession of its chosen habitat. The simple sterile fronds are so deeply pinnatifid that they appear pinnate towards the base, and the pinnæ-like divisions are distinguished by their wavy margins. In the open, their pinkish tinge persists until early summer, at which time the fertile fronds begin to develop.

These are so entirely different in size, form and aspect, it is difficult for the amateur fern student to realize they belong to the same plant. They are shorter, stand stiffly erect, and are apparently covered with small green berries crowded along the branching stem. Actually, these "berries" are tightly rolled up pinnules, covering and protecting the spores. The sterile fronds wither when frost comes, but the fertile fronds turn brown and persist, not only during the winter, but frequently for two or three years. The spores are not shed until spring. As the sensitive fern has creeping, much-branched rootlets, it is easy to dig and grow when given the same cultural treatment as the marsh fern (*Aspidium thelypteris*). Like the latter, it is indifferent as to soil and location.

The Ostrich Fern
Onoclea struthiopteris

The tall plume-like fronds of this magnificent species are suggestive of those of the commoner cinnamon fern (*Osmunda cinnamomea*) but there are two very pronounced differences, which make it easy to tell one from the other. The ostrich fern grows from a stout, but erect rootstock which, like Goldie's fern, may easily be lifted from the loose surrounding mold, while the long, half-buried rootstock of the cinnamon fern, is a horizontal, tough and shaggy affair, that

only the most strenuous efforts can budge. The other marked dissimilarity is in the shape or outline of the fronds. Those of the ostrich fern are broadest near the tip (*ob-lanceolate*) and become gradually narrower toward the base until they almost merge into the stem. Those of the cinnamon fern are, except at the tips, of practically uniform width (*oblong-lanceolate*).

The ostrich fern is most abundant and most luxuriant in the more northern sections where, in low woodland glades or on the moist, sandy banks of streams, it frequently forms dense jungles with the graceful fronds reaching to a height of 6 or 7 feet—or over the average man's head. The sterile fronds grow in circles and are once-pinnate with many closely set pairs of pinnæ, which are pinnatifid nearly to the mid-rib. They bend outwardly in vase-like form and, in mid-summer, the fruiting fronds shoot up in the center of the vase. The fertile fronds, on close examination, will be seen to be once-pinnate, with the pinnæ pinnatifid and each segment rolled backward to the mid-rib, forming a bead-like capsule which contains the spores. Like those of the sensitive fern, these fertile fronds survive the winter, although appearing brown and dead, while the sterile fronds disappear in late autumn.

No fern is easier to grow than the ostrich fern. In fact, it is sometimes a difficult matter to keep it from spreading too rapidly and too far. New plants have a surprising way of shooting up, often at a considerable distance from the original clumps. On investigation, these will be found to be the product of slender, running, underground rootlets, not unlike those of the strawberry, which have been sent out by the parent plant. The accompanying illustration shows an ideal use of the ostrich fern, as an underplanting on the edge of woods, where it is a fine substitute for the ragweeds, docks and thistles, which are too often permitted to take possession of such spots. It is also beautiful and striking when used singly or in small groups, in any situation where its size and graceful habit will fit the surroundings and the soil is circumneutral. When planting, a portion of the crown should be left protruding from the surface. Mulch until established.

The Climbing Fern
Lygodium palmatum

Everyone who can provide a suitable location and the right kind of soil, should grow a few specimens of this rarest of ferns, not only because of its decorative beauty, but because of the necessity of protecting it from extermination. As it is the only fern in the United States with a climbing habit,

the illustration is a sufficient description of its character and aspect. Its cultural requirements are: first, a moist *mediacid*, or intensely acid, soil; second, a situation where it can be guarded against destructive intruders of every nature and where, within convenient reach, are low, twiggy bushes over which it can crawl. It will grow 3 feet long under favorable conditions. I have succeeded best with it by planting it in rich, black, *surface* soil, scraped from the hollows under oak trees, and maintaining a perpetual mulch of half decomposed oak leaves. I give it a position where it is shaded from the hot midday sun and see that it never lacks moisture. The sheep laurel (*Kalmia angustifolia*), the low wood blueberry (*Vaccinium vacillans*) and the black huckleberry (*Gaylussacia baccata*), are excellent companion plants, for support. Pot-grown specimens of the climbing fern are sold by dealers at moderate prices and these are the best kind for planting.

The Royal Fern
Osmunda regalis

The delicate pinks and pale yellows of the uncoiling fronds of the royal fern, have no counterpart in nature save the autumn tints of the sassafras. It is a glorious sight in early May to come upon a broad reach of wooded swamp where every hummock is crowned with young plants of this

wonderfully beautiful fern, and every pool reflects its colorful grace. It is in such locations that it is most abundant and here it attains its most vigorous growth. Its intimate associates are the emerald green tufts of the false hellebore (*Veratrum viride*), the blue flag (*Iris versicolor*) and the golden swamp buttercup (*Ranunculus septentrionalis*); and the mossy mound from which it springs is often gay with the trout lily (*Erythronium americanum*) and the sweet white violet (*Viola blanda*). Later on the fronds change in color to a pale, cool green; they are bi-pinnate and are produced in clumps of from 5 to 15, ranging from 2 to 5 or, infrequently, 6 feet high. The pinnules are oblong in shape and rather openly spaced, giving an airy appearance to the fern that adds much to its grace and charm. The fertile fronds differ from the sterile in having the upper three or four pairs of pinnæ transformed into a rich, brown-colored fruiting panicle, resembling at a distance a cluster of flowers. This characteristic gives the species one of its popular names—the flowering fern. The cultural requirements of the royal fern are simple. It should be given a moist, subacid soil, in partial shade, to secure best results, but will thrive in moderately dry situations, though the fronds will not be

nearly as large. The roots of mature specimens, while bulky, matted and not easy to dig, are by no means as intractable as those of the cinnamon fern; and one can usually find young plants that are very easily handled. They should be planted so the upper surface of the crown is exposed and need no further attention. The royal fern is handsomest and most satisfactory in situations like its natural haunts, but will give a good account of itself in fairly congenial locations, wherever it seems appropriate to use it.

The Interrupted Fern
Osmunda claytoniana

Unlike the other two osmundas, the interrupted fern has no special liking for wet feet. It sometimes wanders down a wooded slope nearly to the edge of a swamp, where the cinnamon and royal ferns are reveling in the placid waters, but it never shows a disposition to "come on in," preferring to be a mere looker on in Venice. I find it most abundant in only moderately moist situations, on thicket-clad hills and in deep ravines, with a special predilection for old stone walls and stony places generally, even if in the open sun. Its ability to flourish in any soil is shown by its popularity for porch or foundation planting, for which purpose it is more generally used than any other species. Not that those who plant it,

know it by name: they have simply discovered, most of them, that this particular fern will grow in such places and other kinds will not. The most distinctive mark of the interrupted fern is the fertile frond with its peculiar spore-bearing pinnæ, of which there are from two to six or seven pairs, right in the middle of the frond. These at first are dark gray-green, almost black, but soon turn brown, shrivel up and disappear, leaving a gap between the intact upper and lower pinnæ that gives the fern its common name. These fruiting pinnæ are often thought to be diseased or blasted by people who do not know the fern. Both fertile and sterile fronds are once-pinnate but deeply pinnatifid into blunt, rounded lobes. If those who confuse this species with the cinnamon fern will compare the shape of these lobes with those of the latter, they will quickly detect the difference. The sterile fronds, which grow in circles, have a pleasing habit of arching away on all sides, leaving the taller fertile fronds standing erect in the center. This gives the plant, which is usually 3 to 5 feet high, a very graceful, fountain-like aspect. The interrupted fern has a typical osmunda root, which, however, can be dug with a moderate expenditure of patience and physical energy. It does not resent trans-

planting and is one of the easiest species to establish in new locations where there is some shade, regardless of the character of the soil. It looks best and most natural as a cover for woodside banks, in fence rows and as an underplanting on the edges of shrub-bordered thickets and copses.

The Cinnamon Fern
Osmunda cinnamomea

This coarse, but stately and handsome species is usually assembled in great numbers, forming dense jungles whose extent is limited only by the boundaries of the marshy areas in which it makes its home. It is an associate of the speckled alder, the bush willows, and the spice bush and, with their aid, builds a formidable barrier around many a "Nature's Sanctuary" where, protected from profane intrusion, the pitcher plants, pogonias, arethusas, showy lady's slippers and many other exclusive beauties, display their charms unseen by any but their most devoted and persistent admirers.

The fertile fronds of the cinnamon fern are the first to appear in early spring. Their pinnæ are so modified and contracted that they bear no resemblance to the sterile fronds, either in form or color, which is a true cinnamon brown. They soon wither and by the first of June only the bare stems remain. The sterile fronds are much taller

than the fruiting fronds, reaching ultimately an average height of 4 feet and, in specially favorable situations, 6 feet or even more. Both kinds of fronds are once-pinnate with the pinnæ deeply pinnatifid into oblong, curving lobes. On the main stem, usually at the base of each pinna, is a tiny tuft of rusty brown wool. The unmistakable and distinctive "trade mark" of this fern, however, is its enormous, black, half-exposed rootstock, resembling nothing so much (as Clute expresses it) as a big shoe brush. The root is built of the dead crowns of preceding years and its length indicates the age of the plant. It is alive only at the end from which the existing fronds are growing, consequently, when transplanting large specimens from the wild, it is wise to take along a keen hatchet, with which the root may be severed a few inches from the crown without affecting the vitality of the fern. In this way, it is possible to dig and transplant the largest sizes to new locations, with comparative ease. Young plants, with easily handled roots, can of course be located and dug, but it takes time for these to attain their full proportions.

The cinnamon fern is frequently seen growing in large patches in open sunny pastures and fields, but in such situations the fronds are stiff and of stunted growth, indicating that

shade and abundant moisture are essential to luxuriant development. As it also belongs in the sub-acid soil class, its correct use in landscape planting is clearly limited to low, wet woods and on the margins of swamps, streams and ponds, where it is protected from the sun by the over-arching boughs of densely foliaged trees and shrubs. In groups of from one to a dozen, however, it may be planted effectively in many other localities where the conditions are fairly favorable.

A FEW UNUSUAL FERNS

The foregoing list of ferns includes all those indigenous to the eastern states that are suitable for general cultivation and landscape work. There are many other hardy kinds, however, that are welcome additions to the fernery or the rock garden, either because they are very odd, or very rare, or present some unusual beauty of frond or coloring. Eight species that belong in this category and can be purchased from dealers are named herewith and their soil preferences indicated.

Hairy Lip Fern (*Cheilanthes lanosa*). A rare rock fern; circumneutral soil. Catalogued as *C. vestita*.

Rock Brake (*Cryptogramma acrostichoides*). A neat, tufted fern, for circumneutral soils.

Oregon Cliff Brake (*Cryptogramma stelleri*. Usually listed as *Pellæa gracilis*. Calcareous rocks, in shade.

Adder's Tongue (*Ophioglossum vulgatum*). Moist, sub-acid soil, in sunny spots; rare.

Hart's Tongue (*Scolopendrium vulgare*). The rarest American species, but abundant in the British Isles. Calcareous rocks, in shade. Plants imported by dealers.

Smooth Woodsia (*W. glabella*). On moist, mossy, shaded rocks, in circumneutral soil.

Ternate Grape Fern (*Botrychium obliquum*). Handsome, purple-green, thrice divided fronds. Moist, subacid soil, in sun. Listed also as *B. ternatum*.

Rattlesnake Fern (*Botrychium virginicum*). Another handsome species, common in deep, rich woods, growing from thick, fleshy roots. May be collected or purchased. Moist subacid soil, in dense shade. Plant 3 to 6 in a group.

GROUPS ACCORDING TO SOIL

For convenient reference, the ferns described in this chapter are here arranged in groups according to their soil acidity preferences.

GROUP NO. 1. SPECIES THAT ARE INDIFFERENT AS REGARDS ACIDITY

Long Beech Fern (*Phegopteris polypodiodes*)
Broad Beech Fern (*Phegopteris hexagonoptera*)
Oak Fern (*Phegopteris dryopteris*)
Ebony Spleenwort (*Asplenium platyneuron*)
Silvery Spleenwort (*Asplenium acrostichoides*)
Lady Fern (*Asplenium filix-fœmina*)
Christmas Fern (*Polysticum acrostichoides*)
Marsh Fern (*Aspidium thelypteris*)
New York Fern (*Aspidium noveboracense*)
Evergreen Wood Fern (*Aspidium marginale*)
Crested Fern (*Aspidium cristatum*)
Clinton's Fern (*Aspidium cristatum*, var. *clintonianum*)
Spinulose Wood Fern (*Aspidium spinulosum*)
Hay-scented Fern (*Dicksonia punctilobula*)
Sensitive Fern (*Onoclea sensibilis*)
Interrupted Fern (*Osmunda claytoniana*)

GROUP NO. 2. SPECIES THAT THRIVE BEST IN CIRCUMNEUTRAL SOILS

Common Polypody (*Polypodium vulgare*)
Maidenhair Fern (*Adiantum pedatum*)
Cliff Brake (*Pellea atropurpurea*)
Maidenhair Spleenwort (*Asplenium trichomanes*)

Narrow-leaved Spleenwort (*Asplenium angustifolium*)
The Walking Leaf (*Camptosorus rhizophyllus*)
Braun's Holly Fern (*Polysticum braunii*)
Male Fern (*Aspidium filix-mas*)
Goldie's Fern (*Aspidium goldianum*)
Bulbiferous Bladder Fern (*Cystopteris bulbifera*)
Fragile Bladder Fern (*Cystopteris fragilis*)
Obtuse Woodsia (*Woodsia obtusa*)
Ostrich Fern (*Onoclea struthiopteris*)
Rock Brake (*Cryptogramma acrostichoides*)
Slender Cliff Brake (*Cryptogramma stelleri*)
Hart's Tongue (*Scolopendrium vulgare*)
Smooth Woodsia (*Woodsia glabella*)

GROUP NO. 3. SPECIES THAT THRIVE BEST IN SUBACID OR MODERATELY ACID SOILS

Bracken (*Pteris aquilina*)
Common Chain Fern (*Woodwardia virginica*)
Spiny Wood Fern (*Aspidium spinulosum*, var. *dilatatum*)
Rusty Woodsia (*Woodsia ilvensis*)
Royal Fern (*Osmunda regalis*)
Cinnamon Fern (*Osmunda cinnamomea*)
Hairy Lip Fern (*Cheilanthes lanosa*)
Grape Fern (*Botrychium obliquum*)
Rattlesnake Fern (*Botrychium virginicum*)

GROUP NO. 4. SPECIES THAT REQUIRE MEDIACID OR INTENSELY ACID SOILS

Narrow-leaved Chain Fern (*Woodwardia areolata*)
Climbing Fern (*Lygodium palmatum*)

CHAPTER IX

Native Plants Around the Home

From the smallest home grounds to the largest estates, there is no residential property without one or more densely shaded areas in the immediate vicinity of the dwelling. As bare ground which is constantly in view, is objectionable, it is not strange that the question most frequently asked by owners is "What can I grow in a shady place?"

In an effort to answer this question many dealers suggest and offer collections of dwarf or low evergreens for porch and foundation plantings, various creeping plants for bare spots under trees and things like day lilies, and foxgloves for other dark nooks and corners. All these things are, with few exceptions, of foreign origin and in my opinion do not solve the problem satisfactorily.

The most desirable plants for the purpose are not yet to be found in the average nursery; they are children of the forest and can be

obtained only from their native haunts, or from a few growers who specialize in their propagation and sale. Yet, when they are tastefully chosen and grouped, the resulting picture is so beautiful, so perfectly natural, that the time and trouble involved in hunting or buying them is amply rewarded.

Before proceeding to specify suitable sorts for porch and foundation planting, I must remind you that it is absolutely essential that the soil in which they are to grow, shall be of proper texture, fertile, and retentive of moisture. In most cases the ground immediately adjacent to foundation walls is a conglomeration of cellar clay, mason's sand, brick-bats, tar paper, lath, plaster and junk. In this stuff even pig weeds will starve. So, if good, rich, deep soil is not already present, the area should be dug out to a depth of at least eighteen inches and the excavation filled with good top-soil, mixed with compost or, better still, with black dirt, or humus from the woods. This done, the permanent success of the plants is practically assured.

It seems to me that a mixed planting, in which evergreen foliage contrasts with frequent displays of color, is the kind that is most pleasing. For example, here is an excellent combination for a bed twenty feet long, by four to five feet wide:

CLUB MOSS (*Lycopodium obscurum*)

Photo by C. R. Shoemaker (*See page 201*)

Four species of club mosses help to carpet the floor of our northern woodlands. They are known commonly as club moss, shining club moss, ground cedar, and ground pine. All are decorative and in demand for Christmas greenery.

GALAX (*G. aphylla*)
Photo by E. T. Wherry (*See page 199*)

OCONEE BELLS (*Shortia galicifolia*)
Photo by C. R. Shoemaker (*See page 199*)

2 Hemlocks (*Tsuga canadensis*)
3 Mountain Laurels (*Kalmia latifolia*)
3 Andromedas (*Andromeda floribunda*)
2 Flame Azalea (*Rhododendron calendulaceum*)
12 Maidenhair Ferns (*Adiantum pedatum*)
8 Virginia Cowslips (*Mertensia virginica*)
25 Canada Violets (*Viola canadensis*)

Avoid straight rows: bring a tall-growing kind to the front in the center and near each end. Aim at groups as irregular as the limited space will permit. Mingle the cowslips with the maidenhair: the latter will display its graceful fronds after the foliage of the other has withered and disappeared, in late May or early June. Use the exquisite, ever-blooming Canada violet for an edging and ground cover in front of the sturdier plants.

A fine combination of ferns and flowers only may be composed of Goldie's shield fern (*Aspidium goldianum*); evergreen wood fern (*Aspidium marginale*); Braun's holly fern (*Polystichum braunii*); wood lily (*Lilium philadelphicum*); false spikenard (*Smilacina racemosa*); and the liverworts (*Hepatica triloba*, or *acutiloba*). A few scattered Jack-in-the-Pulpits (*Arisæma triphyllum*) look well in this group.

Another dainty arrangement, with a singular harmony of foliage, is made up of the

royal fern (*Osmunda regalis*); the maidenhair fern (*Adiantum pedatum*); the red baneberry, (*Actæa rubra*); the white baneberry (*Actæa alba*); the purple rue (*Thalictrum dioicum*); and the columbine (*Aquilegia canadensis*). The two wood anemones (*Anemone quinquefolia*) and (*Anemonella thalictroides*) are just the things for edging.

An infinite number of other charming combinations may be arranged from the following list of easily grown, shade-loving plants:

Common Name	Botanical Name
Carolina Rhododendron	*Rhododendron carolinianum*
Mountain Laurel	*Kalmia latifolia*
Pink Azalea or Pinxter Flower	*Rhododendron nudiflorum*
Flame Azalea	*Rhododendron calendulaceum*
Andromeda	*Andromeda floribunda*
Catesby's Leucothoë	*Leucothoe catesbæi*
Hemlock	*Tsuga canadensis*
Common Juniper	*Juniperus communis* and var. *prostrata*
Red Cedar	*Juniperus virginiana*
Inkberry	*Ilex glabra*
Yellowroot	*Zanthorhiza apiifolia*
Maidenhair Fern	*Adiantum pedatum*
Braun's Holly Fern	*Polystichum braunii*
Male Fern	*Aspidium filix-mas*
Goldie's Fern	*Aspidium goldianum*
Spinulose Wood Fern	*Aspidium spinulosum*, var. *dilatatum*
Evergreen Wood Fern	*Aspidium marginale*
Narrow Leaved Spleenwort	*Asplenium angustifolium*

Common Name	Botanical Name
Silvery Spleenwort	*Asplenium acrostichoides*
Ostrich Fern	*Onoclea struthiopteris*
Royal Fern	*Osmunda regalis*
Broad Beech Fern	*Phegopteris hexagonoptera*
White Baneberry	*Actæa alba*
Red Baneberry	*Actæa rubra*
Windflower	*Anemone quinquefolia*
Purple Rue	*Thalictrum dioicum*
Columbine	*Aquilegia canadensis*
Shooting Star	*Dodecatheon meadia*
White Snakeroot	*Eupatorium urticæfolia*
*Galax	*Galax aphylla*
*Oconee Bells	*Shortia galacifolia*
Liverwort	*Hepatica triloba*
Jack-in-the-Pulpit	*Arisæma triphyllum*
Crested Iris	*Iris cristata*
Wood Lily	*Lilium philadelphicum*
Meadow Lily	*Lilium canadense*
Cardinal Flower	*Lobelia cardinalis*
Great Blue Lobelia	*Lobelia syphilitica*
Virginia Cowslip	*Mertensia virginica*
Wild Blue Phlox	*Phlox divaricata*
May Apple	*Podophyllum peltatum*
Bloodroot	*Sanguinaria canadensis*
False Spikenard	*Smilacina racemosa*
Foam Flower	*Tiarella cordifolia*
Large Flowering Trillium	*Trillium grandiflorum*
Blue Violet	*Viola papilionacea*
Downy Yellow Violet	*Viola pubescens*
Sweet White Violet	*Viola blanda*
Dog Violet	*Viola conspersa*

* Two rare and beautiful plants from the high Alleghanies which may be obtained from dealers.

All of these plants are absolutely hardy. Their care after planting consists in keeping the bed covered with a light mulch of dead

leaves until they are established, pulling out any weeds that appear and never allowing the soil to become dry during the summer months. Hemlocks and junipers may be kept at any desired height by clipping back the leaders once or twice a year. Rhododendrons, azaleas and laurels may be kept within bounds by similar treatment.

It is not a simple matter to solve the problem of what to plant under beeches, soft maples and other trees and shrubs whose roots run near the surface and greedily appropriate the moisture and fertility of the soil. The plants generally recommended for such situations are bugle (*Ajuga reptans*), moneywort or creeping Charlie (*Lysimachia nummularia*) and myrtle (*Vinca minor*), but I have never known any of these aliens to prove permanently successful.

In our upland forests, the class of trees mentioned has numerous representatives and the soil under them is just as dry, just as impoverished, as it is under those growing about our homes. It is therefore very interesting to note the kind of material Nature uses to overcome such adverse conditions, for it has been my experience that there is no better or more reliable guide and teacher. Here are some of the plants she prescribes, according to my field notes:

WHITE BANEBERRY (*Actæa alba*)
Photo by C. R. Shoemaker

RED BANEBERRY (*Actæa rubra*)
Photo by E. L. Crandall

TOOTHWORT (*Dentaria diphylla*)
Photo by E. L. Crandall

CRINKLEROOT (*Dentaria laciniata*)
Photo by C. R. Shoemaker

In dense thickets and under maples: partridgeberry (*Mitchella repens*); downy yellow violet (*Viola pubescens*); shinleaf (*Pyrola* var's.); club mosses (*Lycopodium* species); liverwort (*Hepatica triloba*) in stony ground; Christmas fern (*Polystichum acrostichoides*); and half a dozen kinds of mosses.

Under spreading beeches, on dry, sometimes sandy slopes: creeping speedwell (*Veronica officinalis*); partridgeberry (*Mitchella repens*); yellow star grass (*Hypoxis hirsuta*); violet wood-sorrel (*Oxalis violacea*); birdfoot violet (*Viola pedata*); bluets, or Quaker ladies (*Houstonia cærulea*); smooth aster (*Aster lævis*); blue-stemmed golden-rod (*Solidago cæsia*); and ebony spleenwort (*Asplenium platyneuron*).

These examples show a pleasing variety of foliage and red berries. The partridgeberry (*Mitchella repens*), in poor soil, has small leaves, but forms a compact mat which hugs the ground closely. Its blossoms have the most delicious fragrance imaginable, and its double berries are exceedingly attractive, as long as the birds permit them to remain. It is not difficult to establish, if kept moist for a time and covered with a light mulch of leaves.

The two native creeping Irises (*Iris cristata and Iris verna*) I find do very nicely when

added to an under-tree planting, and both the hay-scented fern (*Dicksonia punctilobula*) and the spinulose wood fern (*Aspidium spinulosum*) give excellent accounts of themselves.

Most everybody admires mosses. Few seem to know, however, that many of them may be successfully transplanted and established in dry, shady places, where the soil is acid. I have cut sods of moss six inches square, and two to three inches thick, brought them home from the woods and had them cover four times the original area, within two years, with the richest kind of carpet.

There are many shady corners on home grounds, where the soil is damp and rich, and every one of them can be made a beauty spot by planting ferns and native wildflowers. One of the loveliest and daintiest plantings I have ever seen was in a shaded fence corner. It was composed of maidenhair fern (*Adiantum pedatum*); shooting star (*Dodecatheon meadia*); Virginia cowslip (*Mertensia virginica*) and white trilliums (*Trillium grandiflorum*), with an edging of the ever-blooming Canada violet. Wild clematis was used to cover the fence.

In such places, the two baneberries, *Actæa alba* with white fruit, and *A. rubra* with red, are exceedingly handsome plants for massing.

The wood lily (*Lilium philadelphicum*), the cardinal flower (*Lobelia cardinalis*) and the culver's root (*Veronica virginica*) may be interspersed among them with striking results.

In low, grassy, partially shaded spots, where the soil is rich and continuously moist, the spring beauty (*Claytonia virginica*); the toothworts (*Dentaria diphylla and D. laciniata*); the trout lily (*Erythronium americanum*); the foam flower (*Tiarella cordifolia*); the Greek valerian (*Polemonium reptans*); Quaker ladies (*Houstonia cærulea*), nearly all the violets, and many of the ferns may be introduced with exquisite effects.

CHAPTER X

Gardening in the Woods

A comprehensive working plan and a fairly definite program of operations are essential aids in the esthetic treatment and development of woodlands.

The plan should consist of an outline map, drawn to scale, upon which, after thorough exploration and study of the tract, the following details have been located:

Springs, streams and pools, rock outcrops and boulders, open glades, groups of evergreen trees, individual trees of unusual size and beauty and other conspicuous *natural* features.

Viewpoints from which beautiful near-by vistas or distant landscapes may be observed and enjoyed.

Suitable situations for shelters and seats, picnic grounds, wild flower and bird sanctuaries, wild gardens, mass plantings and similar embellishments.

Routes for paths and trails—and for roads

THE VIRGINIA CREEPER

"About two days after a tendril has arranged its branches so as to press upon any surface, its curved tips swell, become bright red, and form on their undersides little disks or cushions with which they adhere firmly."—CHARLES DARWIN.

A CARPET OF ASTERS AND FERNS

and bridle paths if the woods are sufficiently extensive.

It is not necessary that a plan of this kind shall be absolutely accurate as regards locations and distances, nor that it shall be followed closely in every particular. It is intended merely as a guide, to be consulted and utilized as far as circumstances and conditions seem to warrant, and to serve as a convenient record of what has been accomplished when the work is finally completed.

It is a good idea in this connection to learn as much as possible about the indigenous trees, bushes, wild flowers and ferns of the locality—their names, habits of growth, soil preferences, and seasons of blooming and fruiting. Such information will be found valuable in determining what species are worthy of being preserved and cherished and in selecting kinds that are best adapted to the different locations where new plantings are to be installed.

As free access to all parts of the woods is a matter of prime importance, the first thing to do in the actual work of improvement, is to lay out necessary roads, paths and trails and put them in good condition for use.

Due regard for naturalistic effect would bar automobile roads entirely from forested

lands. Sometimes, however, the residence cannot be reached in any other way, in which case entrance and service drives through the woods have to be tolerated and made as attractive as can be by tasteful marginal plantings. The construction of such driveways, and of bridle paths as well, is purely an engineering job and is not considered here.

Footpaths and woodland trails should lead to, or connect points of special interest and beauty. As a rule, little work is required to make them passable. Interfering or overhanging bushes, protruding rocks and other obstructions should be removed, inequalities of the ground leveled and stepping stones provided for crossing wet or boggy stretches and shallow streams. Rude bridges, made of logs and unbarked saplings, should be thrown across deep waters and narrow ravines. All semblance of formality or artificial construction should be avoided.

It is neither necessary nor desirable that footpaths should proceed by direct routes, for the forest is an enchanted region in which the longest way around is the shortest way home. So the paths should ramble about among the trees, with unexpected turnings here and there—to skirt a winding brook, for instance, or to permit a close view of some picturesque spot or object. A pleasing in-

formality, and comfortable progress as well, is usually assured by simply following the contours of the ground where no other apparent reason exists for departing from the straight and narrow way.

The highways and byways having been located and put in shape for use, the next task is to remove from their immediate vicinity all dead and dying trees, spindling second growth, unattractive or superfluous shrubs and plants and other unsightly objects. Bushes and young trees that are to be destroyed, should be *grubbed* out, roots and all, as the customary practice of cutting them to the ground, results only in the production of numerous shoots and a ranker growth than before. Poison ivy, cat briars and similar nuisances should be treated in the same heroic manner.

It is a useless waste of energy to attempt to clean up interior areas, border thickets and other localities that cannot be clearly seen, in detail, from the roads and paths. For "distance lends enchantment" and transforms even the most hopeless tangles into real beauty spots. Moreover, the dense undergrowth of bushes, the masses of ferns and the creeping vines and wild flowers that usually carpet the forest floor, constitute a protective ground-cover that maintains

equable conditions of moisture and temperature and is as necessary to the continued health and vigor of the over-arching trees as the soil itself.

Even dead trees, in remote places, may be permitted to remain with advantage, for their trunk cavities and hollow limbs supply both board and lodging to hosts of insectivorous birds, like the woodpecker tribe, and shelter at least to other welcome guests like the owls and the squirrels.

If the borders of the woods are open, as sometimes happens, they should be thickly planted with low growing trees and shrubs of vigorous habit such as the sumacs, the dogwoods, the sassafras, the mountain ash and the viburnums. Thickets of this kind serve at least three useful purposes. They prevent summer winds from sweeping through the forest and drying up the soil; they keep the winter snows from drifting and crushing vegetation and they attract myriads of our most beautiful and useful song birds.

Notably handsome individual trees or shrubs, growing along or near paths and driveways, should be brought into strong relief and encouraged to develop their utmost beauty of form and foliage, by clearing away surrounding growth so as to permit a maximum of room, light and air on all sides.

FRINGE TREE (*Chionanthus virginica*)
Photo by H. S. Barber

WILD BLUE PHLOX AND MAY APPLE
Photo by E. L. Crandall

WOOD BETONY (*Pedicularis canadensis*)

An unlovely common name for this really lovely wilding is "louse-wort," from a belief prevalent in some localities that if sheep eat the plant, they are attacked by a skin disease caused by a tiny "cootie" (*pediculus*).

And the charm of open glades, with their uncontrolled riots of wild flowers and ferns, should not be overlooked. Where such free spaces exist naturally, they should be made accessible; or they may be created artificially, at suitable intervals along traveled ways, by choosing and clearing out irregular areas on which no large or particularly attractive trees are growing. Such glades are admirable places for rustic seats and are frequently so situated that vistas may be opened by cutting lanes through unimportant growth and delightful glimpses of distant landscapes enjoyed.

The great secret of success with woodland plantings is to keep the roots of the plants cool and moist by the application of a mulch of dead leaves at the time they are installed. It is important and usually possible to obtain leaves for this purpose that will, as they decay, cater to the soil preferences of the plants. (For example, a mulch of pine or hemlock needles, or oak leaves, will contribute greatly to the vigorous growth of rhododendrons and laurel, and all shrubs and flowering plants which grow naturally in *mediacid*, or very acid soils.) The mulch should vary in thickness according to the size and habit of the plants—an inch or two for wild flowers and ferns and four to

six inches for shrubs and trees. It should be carefully maintained until they are well established, after which Nature will give them all needed attention.

The lists which follow are intended to be suggestive and helpful only and are by no means complete. They include woodland species of a decorative character that are worthy of preservation if present, or that may be added to enrich the local flora. The arrangement in groups makes it a simple matter to consult the descriptive and cultural information printed elsewhere, and select appropriate kinds for any location or purpose.

ORNAMENTAL TREES AND TREE SHRUBS

1. *For Massing in the Background along Driveways*

Common Name	*Botanical Name*
Hemlock	*Tsuga canadensis*
Arborvitæ	*Thuya occidentalis*
White Pine	*Pinus strobus*
American Hornbeam	*Carpinus caroliniana*
American Crab	*Pyrus coronaria*
Mountain Ash	*Pyrus americana*
Washington Thorn	*Cratægus phænopyrum*
Cockspur Thorn	*Cratægus crus-galli*
Redbud	*Cercis canadensis*
Striped Maple	*Acer pennsylvanicum*
Flowering Dogwood	*Cornus florida*
Silver-bell Tree	*Halesia carolina*

2. *For Isolated Specimens along Roads and Paths*

Common Name	*Botanical Name*
Hemlock	*Tsuga canadensis*
Carolina Hemlock	*Tsuga caroliniana*
Red Cedar	*Juniperus virginiana* and varieties
Paper Birch	*Betula alba*, var. *papyrifera*
Mountain Ash	*Pyrus americana*
Redbud	*Cercis canadensis*
Flowering Dogwood	*Cornus florida*
Pepperidge Tree	*Nyssa sylvatica*
Virgilia	*Cladrastis lutea*

3. *For Border Thickets*

White Pine	*Pinus strobus*
White Spruce	*Picea canadensis*
Arborvitæ	*Thuya occidentalis*
American Hornbeam	*Carpinus caroliniana*
Gray Birch	*Betula populifolia*
Paper Birch	*Betula alba*, var. *papyrifera*
Sassafras	*Sassafras variifolium*
American Crab	*Pyrus coronaria*
Hawthorns	*Cratægus*, species
Redbud	*Cercis canadensis*
Flowering Dogwood	*Cornus florida*

SHRUBS—DECIDUOUS AND EVERGREEN

1. *For Mass Planting on Steep Slopes Seen from Roads and Paths*

Common Name	*Botanical Name*
Bayberry	*Myrica carolinensis*
Sweet Fern	*Myrica asplenifolia*
Shadbush	*Amelanchier canadensis*
Shining Sumac	*Rhus copallina*
Fragrant Sumac	*Rhus canadensis*

Common Name	*Botanical Name*
Mountain Holly	*Nemopanthus mucronata*
Hobble Bush	*Viburnum alnifolium*
Flowering Raspberry	*Rubus odoratus*
Rose Bay	*Rhododendron maximum*
Mountain Laurel	*Kalmia latifolia*
Flame Azalea	*Rhododendron calendulaceum*
Pinxter Flower	*Rhododendron nudiflorum*

2. *For Border Plantings along Automobile Driveways*

Sweet Gale	*Myrica gale*
Spice Bush	*Benzoin æstivale*
Wild Hydrangea	*Hydrangea arborescens*
Gray Hydrangea	*Hydrangea cinerea*
Fragrant Sumac	*Rhus canadensis*
Witch Hazel	*Hamamelis virginica*
Nine-bark	*Physocarpus opulifolius*
Shadbush	*Amelanchier canadensis*
Fragrant Sumac	*Rhus canadensis*
Smoke-Tree	*Rhus cotinoides*
Winterberry	*Ilex verticillata*
Strawberry Bush	*Evonymus americanus*
American Bladder Nut	*Staphylea trifolia*
Bush Dogwoods	*Cornus*, species
Sweet Pepperbush	*Clethra alnifolia*
Fringe Tree	*Chionanthus virginica*
Snowberry	*Symphoricarpos racemosus*
Highbush Cranberry	*Viburnum opulus*
Withe-rod	*Viburnum cassinoides*
Nannyberry	*Viburnum lentago*
Arrow-wood	*Viburnum dentatum*
Rose Bay	*Rhododendron maximum*

3. *For Underplantings along Automobile Driveways*

American Yew	*Taxus canadensis*
Spreading Juniper	*Juniper communis*, var. *depressa*
Bayberry	*Myrica carolinensis*

Common Name	*Botanical Name*
Sweet Fern	*Myrica asplenifolia*
Inkberry	*Ilex glabra*
Strawberry Shrub	*Evonymus obovatus*
New Jersey Tea	*Ceanothus americanus*
Bush Honeysuckle	*Diervilla lonicera*
Meadowsweet	*Spiræa latifolia*
Pinxter Flower	*Rhododendron nudiflorum*
Rhodora	*Rhododendron canadense*
Wild Rosemary	*Andromeda polifolia*
Mountain Laurel	*Kalmia latifolia*
Black Huckleberry	*Gaylussacia baccata*
Dwarf Early Blueberry	*Vaccinium pennsylvanicum*
Late Blueberry	*Vaccinium vacillans*

4. *For Planting along Bridle Paths, Trails and Footpaths and for Boundaries to Open Glades*

Common Juniper	*Juniperus communis*
American Yew	*Taxus canadensis*
Sweet Bay	*Magnolia virginiana*
Wild Hydrangea	*Hydrangea arborescens*
Gray Hydrangea	*Hydrangea cinerea*
Virginia Itea	*Itea virginica*
Red Chokeberry	*Pyrus arbutifolia*
Shadbush	*Amelanchier canadensis*
Rose Acacia	*Robinia hispidus*
Shining Sumac	*Rhus copallina*
American Holly	*Ilex opaca*
Winterberry	*Ilex verticillata*
Mountain Holly	*Nemopanthus mucronata*
Burning Bush	*Evonymus atropurpureus*
Stewartia	*Stewartia malachodendron*
Leatherwood	*Dirca palustris*
Sweet Pepperbush	*Clethra alnifolia*
Fringe Tree	*Chionanthus virginica*
Buttonbush	*Cephalanthus occidentalis*
Snowberry	*Symphoricarpos racemosus*
Hobble Bush	*Viburnum alnifolium*

Common Name	*Botanical Name*
Highbush Cranberry	*Viburnum opulus*
Withe-rod	*Viburnum cassinoides*
Dwarf Wild Rose	*Rosa lucida*
Smooth Azalea	*Rhododendron arborescens*
Flame Azalea	*Rhododendron calendulaceum*
Pink-Shell Azalea	*Rhododendron vaseyi*
Rhodora	*Rhododendron canadense*
Mountain Rose Bay	*Rhododendron catawbiense*
Carolina Rhododendron	*Rhododendron carolinianum*
Mountain Laurel	*Kalmia latifolia*
Catesby's Leucothoë	*Leucothoe catesbæi*
Andromeda	*Andromeda floribunda*
Black Huckleberry	*Gaylussacia baccata*
Highbush Blueberry	*Vaccinium corymbosum*

HARDY FERNS

1. *For Mass Plantings in Moist Shaded Places*

Common Name	*Botanical Name*
Maidenhair Fern	*Adiantum pedatum*
Narrow-leaved Spleenwort	*Asplenium angustifolium*
Silvery Spleenwort	*Asplenium acrostichoides*
Lady Fern	*Asplenium filix-fœmina*
Braun's Holly Fern	*Polystichum braunii*
Goldie's Fern	*Aspidium goldianum*
Clinton's Fern	*Aspidium cristatum*, var. *clintonianum*
Spinulose Wood Fern	*Aspidium spinulosum*
Ostrich Fern	*Onoclea struthiopteris*
Royal Fern	*Osmunda regalis*
Cinnamon Fern	*Osmunda cinnamomea*

2. *For Rocky and Shady Hillsides in Moist Soil*

Christmas Fern	*Polystichum acrostichoides*
Evergreen Wood Fern	*Aspidium marginale*

THE GOLDEN RAGWORT
Senecio aureus

WILD BLUE PHLOX FOR A CARPET
Phlox divaricata

TALL MEADOW RUE (*Thalictrum polygamum*)

The meadow rue relies upon the winds to scatter its pollen, which it produces in great abundance and which is very light and dry. The plant therefore towers above the surrounding midsummer vegetation in order to take advantage of every breeze that blows.

GREAT LOBELIA (*L. syphilitica*)
Photo by C. R. Shoemaker

THE FOAM FLOWER (*Tiarella cordifolia*)
Photo by C. R. Shoemaker

Common Name	*Botanical Name*
Male Fern	*Aspidium filix-mas*
Spinulose Wood Fern	*Aspidium spinulosum*, var. *dilatatum*
Bulbiferous Bladder Fern	*Cystopteris bulbifera*
Interrupted Fern	*Osmunda claytoniana*

3. *For Ground Cover in Glades and Other Moist, Shaded Localities*

Long Beech Fern	*Phegopteris polypodiodes*
Broad Beech Fern	*Phegopteris hexagonoptera*
Maidenhair Fern	*Adiantum pedatum*
New York Fern	*Aspidium noveboracense*
Crested Fern	*Aspidium cristatum*

4. *For Dry Locations either in Shade or Sun*

Bracken	*Pteris aquilina*
Ebony Spleenwort	*Asplenium platyneuron*
Lady Fern	*Aspidium filix-fœmina*
Rusty Woodsia	*Woodsia ilvensis*
Hay-scented Fern	*Dicksonia punctilobula*

WOODLAND WILD FLOWERS

1. *Tall Growing Kinds for Moist Shaded Situations*

Common Name	*Botanical Name*
Meadow Lily	*Lilium canadense*
Tall Meadow Rue	*Thalictrum polygamum*
Black Snakeroot	*Cimicifuga racemosa*
Goat's Beard	*Aruncus sylvester*
Bee Balm	*Monarda didyma*
Culver's Root	*Veronica virginica*
Golden Ragwort	*Senecio aureus*

2. *Tall Growing Kinds for Dry Places, in Sun or Shade*

Common Name	*Botanical Name*
Tick Trefoil	*Desmodium canadense*
Butterfly Weed	*Asclepias tuberosa*
Golden Aster	*Chrysopsis mariana*
Smooth Aster	*Aster lævis*
Ten-petaled Sunflower	*Helianthus decapetalus*

3. *Species of Medium Height for Moist Shade*

Spiderwort	*Tradescantia virginica*
False Spikenard	*Smilacina racemosa*
Large-flowered Bellwort	*Uvularia grandiflora*
Wake-robin	*Trillium erectum*
Large Flowering Trillium	*Trillium grandiflorum*
Early Meadow Rue	*Thalictrum dioicum*
Columbine	*Aquilegia canadensis*
Red Baneberry	*Actæa rubra*
White Baneberry	*Actæa alba*
May Apple	*Podophyllum peltatum*
Wild Geranium	*Geranium maculatum*
Wild Blue Phlox	*Phlox divaricata*
Virginia Cowslip	*Mertensia virginica*
Great Blue Lobelia	*Lobelia syphilitica*
White Snakeroot	*Eupatorium urticæfolium*
Blue Mist Flower	*Eupatorium cœlestinum*

4. *Low Growing Kinds Suitable for Ground Cover on Moist Shaded Areas*

Canada Mayflower	*Maianthemum canadensis*
Lily of the Valley	*Convallaria majalis*
Dogtooth Violet	*Erythronium americanum*
Dwarf Iris	*Iris verna*
Crested Iris	*Iris cristata*
Rattlesnake Plantain	*Epipactis pubescens*
Wild Ginger	*Asarum canadense*

Common Name	*Botanical Name*
Spring Beauty	*Claytonia virginica*
Liverwort	*Hepatica triloba*
Sharp-lobed Liverwort	*Hepatica acutiloba*
Goldthread	*Coptis trifolia*
Twinleaf	*Jeffersonia diphylla*
Toothwort	*Dentaria diphylla*
Cut-leaved Toothwort	*Dentaria laciniata*
Foam Flower	*Tiarella cordifolia*
Alumroot	*Heuchera americana*
Wild Wood Strawberry	*Fragaria vesca*
Wild Geranium	*Geranium maculatum*
Fringed Milkwort	*Polygala paucifolia*
Common Blue Violet	*Viola papilionacea*
Sweet White Violet	*Viola blanda*
Canada Violet	*Viola canadense*
Dog Violet	*Viola conspersa*
Wintergreen	*Gaultheria procumbens*
American Cowslip	*Dodecatheon meadia*
Star Flower	*Trientalis americana*
Greek Valerian	*Polemonium reptans*
Forget-me-not	*Myosotis scorpioides*
Common Speedwell	*Veronica officinalis*
Wood Betony	*Pedicularis canadensis*
Partridgeberry	*Mitchella repens*

CHAPTER XI

The Protection of Native Plants

One of the chief purposes of this book is to emphasize the dangers which threaten the very existence of our distinctive native flora and to urge the adoption of practical measures for its protection and preservation.

The enemies of the wild plants may be divided into three classes—those whose work of destruction is unavoidable, those who wantonly devastate the woods and fields for commercial profit and those who, often thoughtlessly, uproot flowering plants, or break down and ruin blossoming shrubs and trees for temporary personal pleasure.

The clearing of woodlands, the draining of swamps, and other agricultural operations, are responsible for the wiping out of millions of beautiful plants; and other untold numbers are annihilated by grading operations, road making and real estate developments. Yet, such activities are matters of necessity and usually there seems to be no way of avoiding the resulting damage. Sometimes, however,

it is possible, with full consent of the owner, to rescue many of the endangered plants by taking them up and removing them to safer quarters.

The second class of offenders includes certain wholesale and retail florists, a host of unscrupulous collectors, and many self-styled landscape contractors and gardeners who go or send their employees into the forests and other wild places and gather trailing arbutus, ground pine, mountain laurel, winterberry and other rare plants by the wagon load. The spoil of these bandits may be seen displayed in flower stores or hawked about the streets of our cities nearly every day in the year. One particularly aggravated instance of this sort of vandalism was told me by the chief vandal himself. He is a "Landscape Forester" according to his business card ("Landscape Destroyer" would be more appropriate) and he boasted of having just bought 20,000 mountain laurel bushes at *ten cents each.* He said he got them from head gardeners of private estates who not only took his money, but actually helped his men to dig the plants *at times when the owners were away.* He sold them to a big Country Club at *38 cents each* and planted them in a shrubbery border, where nine out of ten of them died shortly afterwards.

There are many kinds of culprits who belong in the third class. The worst one is the automobilist who defaces the scenic beauty of the countryside by tearing up flowering plants and breaking off the limbs and branches of ornamental trees, shrubs and evergreens, all to be packed in his car, carried home and, after a few hours, thrown on the trash heap. The results of this sort of destruction are apparent to everyone who travels over our main highways. Long stretches of woodland and meadow, that but a few years ago were gay in season with the blooms or fruit of the dogwood, the winterberry, the hawthorn, and the laurel, now display only the stumps of ruined trees, and the splintered stems and twigs of broken-down bushes.

The records of the Wild Flower Preservation Society of America contain many verified records of what may be termed thoughtless destruction. The following cases are remarkable when the character of the offenders is considered:

A clergyman asked his Sunday school scholars to go into the woods and collect all the trailing arbutus they could find. They did so and brought back hundreds of plants, which were offered as an inducement to attend a Sunday night service.

The Central Young Men's Christian Association, of Washington, D. C., issued a request to members owning automobiles to scour the country for dogwood, to be used for decorating their auditorium. The local Wild Flower Preservation Society learned of this request in time to have it countermanded before any damage was done.

In a *Nature Bulletin*, an official of the Boy Scouts suggested May parties for the purpose of picking "vast quantities of trailing arbutus, along with bunches of the rarer [*sic*] adder's tongue, or dogtooth violet."

A Manhattan public school teacher, who took her pupils to visit the New York Botanical Garden, helped them to pull up four hundred and ten Jack-in-the-pulpits which had been carefully colonized in a secluded corner.

And a Chicago high school instructor boasted openly of her prowess in collecting several hundred pink lady's slippers, plants and all, during one afternoon's raid.

Strange as it may seem, sincere admirers of wild flowers who would do nothing intentionally to exterminate them, must, nevertheless, be numbered among their enemies. In this category are the excursionists and picnickers who, often thoughtlessly, pluck the delicate blossoms by the armful, appar-

ently not realizing that they are robbing each denuded plant of at least one vital means of reproduction by preventing it from ripening seed. Moreover, many woodland and bog plants grow in such light, spongy soil that pulling the flowers means pulling up the entire plant by the roots. This is, of course, fatal as regards all means of reproduction.

Finally, there are the impulsive and uninformed diggers or buyers of rare plants, who cannot resist the temptation to try growing them in their gardens or other uncongenial localities around their homes, and put them in the ground without knowing or heeding their indispensable cultural requirements. Such practice is triply destructive; for the misplaced plants soon perish miserably, all hope of posterity is destroyed as far as they are concerned, and the wild places from which they are taken are robbed of at least a share of their natural beauty.

Having called attention to the principal foes of the native flora and given some idea of the appalling results of their activities, the next thing in order is to consider what has been or can be done to rescue the survivors, and protect them from further depredations.

The defensive measures that have been put into effect with sufficient success to

TRILLIUMS AND DUTCHMAN'S BREECHES
Photo by E. L. Crandall

SPOTTED WINTERGREEN (*Chimaphila maculata*)
Photo by C. R. Shoemaker

THE MAY APPLE IN COMPLETE POSSESSION

warrant their wider application, may be classified as Educational, Legislative and Cultural.

The Society for the Protection of Native Plants, the Wild Flower Preservation Societies and the Garden Club of America, aided by the active coöperation of interested individuals and local Garden and Nature clubs, have done admirable work along educational lines. They have awakened general interest in the welfare of wild plants, they have created public sentiment in favor of stringent protective laws, they have secured the coöperation of the schools in teaching children to know, cherish, and refrain from injuring the wild flowers, and they have enlisted the valuable aid of newspapers and other periodicals in carrying on the work.

Among the many excellent circulars that have been issued and given wide distribution, perhaps the most effective are those which specify flowers that may be gathered freely, those that may be picked sparingly and carefully and those that should be left untouched. Such lists necessarily differ in widely separated sections, as species that are rare in one locality, are often over-abundant in others. One of the best of these lists is here reproduced, with a few omissions of purely local significance. It was compiled by Mr. P. L.

Ricker, Secretary of the Washington, D. C., Chapter of the Wild Flower Preservation Society of America, and is used with his permission.

GROUP 1. *Wild Flowers that should not be picked, at least in quantity, within twenty-five miles of any large town or tourist point.*

All wild orchids and wild lilies; pitcher plants; trailing arbutus; shooting stars (*Dodecatheon*); trilliums; holly; swamp magnolia; ground pines; columbine; jack-in-the-pulpit; rhododendron; wild pink; water lilies; wild azalea; lady's slipper; mountain laurel; dogwood; redbud; anemone (windflower); fringed gentian; bluebells (*Campanula*); arethusa; dutchman's breeches; squirrel corn; cardinal flower; maidenhair and walking fern; bird-foot violet; spotted wintergreen (*Chimaphila*); solomon's seal; false spikenard; indian pipe.

GROUP 2. *Wild Flowers that may be picked in moderation if roots are not disturbed and plenty of flowers left to make seed.*

Spring beauty; hepatica; dogtooth violet; bluets (Quaker ladies); may apple; bloodroot; ferns; rhodora; marsh marigold; arrowhead; wild roses; meadowsweet; clematis; meadow rue; all common violets; yellow wood sorrel; closed

THE SCENTED PURPLE FRINGED ORCHIS
Habenaria psycodes

THE YELLOW FRINGED ORCHIS
Habenaria ciliaris

gentian; partridgeberry; marsh pinks (*Sabbatia*); beard-tongue (*Pentstemon*); and iris.

GROUP 3. *Native and Foreign Flowers (weeds) that may be picked freely.*

All asters and goldenrods; bouncing Bet; butter and eggs; daisy; star of Bethlehem; golden ragwort; Japanese honeysuckle; cat-tails; pickerel weed; wild carrot; buttercups; jewel weed; wild mustards; cinquefoil; all clovers and vetches; St. Johnswort; evening primrose; chicory; milkweed; dogbane; morning glory; vervain; heal-all (*Prunella*); ground ivy; mullein; blazing star (*Liatris*); everlasting; ironweed; golden aster; black-eyed Susan; dog fennel; blueweed; yarrow; and all wild sunflowers.

Another circular of the society requests strict observance of the following simple but entirely reasonable rules:

(*a*) Cut wild flowers with scissors or pocket-knife; never pull them.

(*b*) Never strip a plant of all its flowers; leave enough to perfect seed.

(*c*) Cut, cleanly and sparingly, branches of flowering or fruiting shrubs and trees. Never break or tear them off. Have some regard for appearances after the operation and give the wounds a chance to heal.

Legislative action for the protection of native plants has, at this writing, been taken by only a few states. Some of the laws passed seem to be sufficiently comprehensive and drastic to meet all requirements *provided they are enforced.* Others are so mild or so limited in their application that they are practically useless.

Maryland has a law that is admirable, one that should be adopted as a pattern by other states. It provides a fine of from five to twenty-five dollars, or ninety days imprisonment, or both, for either of the following offenses:

For removing, taking, cutting, breaking, injuring or destroying any tree, shrub, flower, vine, moss or turf, or attempting to do so, without the personal direction or written consent of the owner.

For taking Christmas trees, evergreens, holly or mistletoe from any woods without permission from the owner.

Massachusetts has a similar law with a special penalty added for the automobilist, who forfeits his license, besides being subject to fine and imprisonment, if convicted of vandalism.

On the other hand, the much quoted Vermont law proves on careful reading to be inadequate and insufficient to a surprising

degree. It assumes to protect and prevent the sale of forty-two species of wild plants, comprising ten trees and shrubs, twenty-one flowering plants, nine ferns and two club mosses. Only six of these, however, are known by or are of the slightest interest to any one but professional botanists and of the six, only three are sold in any appreciable quantity by dealers. In fact, the law is evidently aimed at the scientific collector who does little harm, rather than the irresponsible vandal who destroys everything in sight.

Dr. R. C. Benedict, of the Brooklyn, N. Y., Botanic Garden, in an article written for the *American Fern Journal*, entitled "Game Laws for Ferns and Wild Flowers," makes two excellent suggestions:

"Ferns and flowering plants need to be treated as are the birds, which are divided into protected and unprotected lists.

"Lovers of wild plants in various states should ask their respective legislatures . . . to establish protected lists of plants, the sale of which should be restricted to supplies artificially propagated."

A statute which would embody the Maryland law in its entirety, the added penalty for automobile vandals provided in the Massachusetts law, and specified lists of rare plants that must *not* be collected from the

wild and can only be offered for sale if artificially propagated, would come nearer meeting the emergency than any now in existence.

And there should be another law forbidding the offering for sale of any flowers, fruit, foliage or fronds taken from the following plants: trailing arbutus, partridgeberry, false spikenard (*Smilacina racemosa*), marsh marigold, dogwood, winterberry, mountain laurel, spinulose wood fern, Christmas fern, evergreen wood fern.

To be entirely effective such laws would, of course, have to be rigidly enforced and it remains to be seen whether the friends of the wild flowers can compel the making of adequate provision even for the purpose of enforcing those now in existence.

It is becoming more and more apparent every year that cultural, as well as educational and legislative measures, must be more generally applied than they are at present, if we are to successfully counteract the alarming mortality which prevails generally among our native plants and threatens many rare and beautiful species with utter extinction.

In order to decide what cultural methods may be safely adopted and how they shall be employed, it is necessary to divide the wild plants into two general classes.

(*a*) Those that can be successfully grown under ordinary methods of cultivation and,

(*b*) Those that require special treatment.

Most of our trees and shrubs belong in the first class (see Chapters IV and V). There is no reason why any of them should not be propagated in the usual way, by commercial growers and nurserymen, and offered for sale to the general public. The flowering plants and ferns that have been found to be indifferent as regards soil conditions (Chapters VII and VIII) are also easily cultivated and no restrictions need be placed upon their purchase or even upon their collection for use in congenial locations. Many of these plants can be grown from seed, which may be bought from seedsmen or gathered in the fields and forests, and others can be increased by annual division of the roots, a familiar proceeding to all garden lovers.

It is only the rhododendrons, azaleas, mountain laurel, trailing arbutus and other members of the Heath family (Chapter VI) and those wild flowers and ferns that belong to the *circumneutral*, *subacid* and *mediacid* groups (Chapters VII and VIII) that require unusual and specific treatment. As these, however, include nearly all the plants that are in most urgent need of protection, it is of vital importance that everything possible be

done to increase their numbers by both growers and private owners.

This can only be accomplished through strict compliance with tested and proved cultural directions as given in this book, and no one who is not in a position to follow these directions to the letter should attempt to grow or establish any of them.

The safest place for their protection and perpetuation is the Wild Flower Sanctuary. A wisely located and properly guarded sanctuary needs no laws or educational propaganda to prevent its violation. Within its boundaries suitable conditions of soil, moisture and exposure may be found, or provided, for even the most fastidious of the wildings, and there they will flourish, reproduce themselves and increase in numbers as long as the sanctuary exists. Concise suggestions for locating, treating and planting wild flower sanctuaries are given in the following chapter.

IDEAL FOR A SANCTUARY

A NATURAL WILD FLOWER SANCTUARY

Hobble Bush, Cinnamon and Maidenhair Ferns, Indian Pipe, Senecio, Trillium and Orchids

Photo by E. L. Crandall

CHAPTER XII

Wild Flower Sanctuaries

Anyone may make a wild flower sanctuary who has a place that he can call his own. Even on the grounds of a modest suburban or village home a surprising number of choice native plants can be grown and protected. A shaded corner, the north side of a building and many other places where it is commonly supposed nothing will grow, are good locations. All that is necessary is to provide suitable soil, choose and obtain the right plants, give them the simple cultural attention required to establish them, and let them alone.

On large country estates, there is opportunity for the creation of wild flower sanctuaries of extensive proportions, where great numbers of plants may be colonized and given needed protection. Indeed, if the coöperation of only a moderate proportion of American estate owners can be obtained, the problem of preserving rare kinds will be solved. Numerous efforts have been made

to establish preserves in Parks, Botanical Gardens and other places of public resort, but they have all, thus far, been unsuccessful. There are still too many visitors to such places who pay no heed to warning signs; and the unusual or strikingly attractive specimen is soon uprooted and carried away. It also seems hopeless to give adequate protection in our rapidly disappearing nearby woodlands. Therefore the case of the vanishing wildings is largely up to the proprietors of country places, who, as a rule, are men of taste and discernment and ready to consider favorably any practical suggestion for the esthetic development of their property, which is exactly what the sanctuary idea means. It not only provides safe and needed harbors for plant species in danger of extermination, but it transforms neglected and untidy areas into the most beautiful and interesting features of the place. It literally makes glad the waste places, the ones usually considered useless for cultivation and unworthy of attention of any kind.

The wild flower sanctuary may be located along or at the end of a woodland path, or on a rocky ridge or outcrop. It may occupy a bit of boggy ground or meadow, or border the course of a winding brook. It may serve as a mantle of beauty for *a*

barren hillside or display its treasures on the banks of a shimmering pool. The means of protection against intruders usually adopted for country estates, are all that is needed for the sanctuary.

The following species and varieties of native plants, include not only rare and threatened kinds, but many others, chosen because they are congenial and appropriate companions, because they furnish welcome shelter for those that are more delicate, or simply because they enhance the beauty of the preserve.

TREES AND SHRUBS NEEDING PROTECTION

Common Name	*Botanical Name*
Flowering Dogwood	*Cornus florida*
Redbud	*Cercis canadensis*
American Holly	*Ilex opaca*
Mountain Laurel	*Kalmia latifolia*
Pinxter Flower or Pink Azalea	*Rhododendron nudiflorum*
Black Alder or Winterberry	*Ilex verticillata*

FERNS NEEDING PROTECTION

Common Name	*Botanical Name*
Maidenhair Fern	*Adiantum pedatum*
Christmas Fern	*Polystichum acrostichoides*
Braun's Holly Fern	*Polystichum braunii*
Evergreen Wood Fern	*Aspidium marginale*
Spinulose Wood Fern	*Aspidium spinulosum*, var. *dilatatum*
Goldie's Fern	*Aspidium goldianum*

WILD FLOWERS NEEDING PROTECTION

Common Name	*Botanical Name*
False Spikenard	*Smilacina racemosa*
Wood Lily	*Lilium philadelphicum*
Meadow Lily	*Lilium canadense*
Turk's Cap Lily	*Lilium superbum*
Rattlesnake Plantain	*Epipactis pubescens*
Showy Orchis	*Orchis spectabile*
Yellow Fringed Orchis	*Habenaria ciliaris*
Purple Fringed Orchis	*Habenaria psycodes*
*White Fringed Orchis	*Habenaria blephariglottis*
Yellow Lady's Slipper	*Cypripedium pubescens*
Showy Lady's Slipper	*Cypripedium hirsutum*
Pink Lady's Slipper	*Cypripedium acaule*
Wild Pink	*Silene pennsylvanica*
Wood Anemone	*Anemone quinquefolia*
Liverwort	*Hepatica triloba*
Sharp-lobed Liverwort	*Hepatica acutiloba*
Marsh Marigold	*Caltha palustris*
Columbine	*Aquilegia canadensis*
Pitcher Plant	*Sarracenia purpurea*
Foam Flower	*Tiarella cordifolia*
Bishop's Cap	*Mitella diphylla*
Bittersweet	*Celastris scandens*
Bird-foot Violet	*Viola pedata* and var. *bicolor*
Pipsissewa	*Chimaphila umbellata*
Spotted Wintergreen	*Chimaphila maculata*
Trailing Arbutus	*Epigæa repens*
Shooting Star	*Dodecatheon meadia*
Fringed Gentian	*Gentiana crinita*
Closed Gentian	*Gentiana andrewsii*
Butterfly Weed	*Asclepias tuberosa*
Wild Blue Phlox	*Phlox divaricata*
Virginia Cowslip	*Mertensia virginica*

*NOTE—The white-fringed orchid (*Habenaria blephariglottis*) is not mentioned elsewhere in this book because, although very lovely, it does not take kindly to cultivation.

THE GAY ORANGE BUTTERFLY WEED. *Asclepias tuberosa*

Oswego Tea or Bee Balm
Monarda didyma

Common Name	*Botanical Name*
Partridgeberry	*Mitchella repens*
Twin-Flower	*Linnæa borealis* var.
Bluebell	*Campanula rotundifolia*
Cardinal Flower	*Lobelia cardinalis*

COMPANION PLANTS SUGGESTED FOR SANCTUARY PLANTING

Coniferous Evergreens

Common Name	*Botanical Name*
Hemlock	*Tsuga canadensis*
White Pine	*Pinus strobus*
Red Cedar	*Juniperus virginiana*
Common Juniper	*Juniperus communis* and var. *depressa*
White Spruce	*Picea canadensis*

Broad-leaved Evergreens

Rose Bay	*Rhododendron maximum*
Carolina Rhododendron	*Rhododendron carolinianum*
Andromeda	*Andromeda floribunda*
Catesby's Leucothoë	*Leucothoë catesbæi*
Sand Myrtle	*Leiophyllum buxifolium*
Bearberry	*Arctostaphylos uvi-ursa*
Inkberry	*Ilex glabra*

Deciduous Shrubs

Flame Azalea	*Rhododendron calendulaceum*
Pink-shell Azalea	*Rhododendron vaseyi*
Swamp Azalea	*Rhododendron viscosum*
Sweet Pepperbush	*Clethra alnifolia*
Gray Dogwood	*Cornus paniculata*
Sweet Gale	*Myrica gale*
Mountain Holly	*Nemopanthus mucronata*
Dwarf Wild Rose	*Rosa lucida*

Common Name	*Botanical Name*
Highbush Blueberry	*Vaccinium corymbosum*
Dwarf Late Blueberry	*Vaccinium vacillans*
Withe-rod	*Viburnum cassinoides*
Highbush Cranberry	*Viburnum opulus*
Red Chokeberry	*Pyrus arbutifolia*
Thorns in Variety	*Cratægus* species

Wild Flowers

Red Baneberry	*Actæa rubra*
White Baneberry	*Actæa alba*
Dogtooth Violet (Trout Lily)	*Erythronium americanum*
White Snakeroot	*Eupatorium urticæfolium*
Blue Mist Flower	*Eupatorium cœlestinum*
Alumroot	*Heuchera americana*
Crested Iris	*Iris cristata*
Blue Lobelia	*Lobelia syphilitica*
Grass-of-Parnassus	*Parnassia carolinianum*
Lovely Phlox	*Phlox amœna*
False Dragonhead	*Physostegia virginica*
May Apple	*Podophyllum peltatum*
Bloodroot	*Sanguinaria canadensis*
Large Flowering Trillium	*Trillium grandiflorum*
Wake-robin	*Trillium erectum*
Blue Violet	*Viola papilionacea*
Downy Yellow Violet	*Viola pubescens*
Canada Violet	*Viola canadensis*

Ferns and Mosses

Crested Fern	*Aspidium cristatum*, var. *clintonianum*
New York Fern	*Aspidium noveboracense*
Narrow-leaved Spleenwort	*Asplenium angustifolium*
Silvery Spleenwort	*Asplenium acrostichoides*
Bulbiferous Bladder Fern	*Cystopteris bulbifera*
Fragile Bladder Fern	*Cystopteris fragilis*
Ostrich Fern	*Onoclea struthiopteris*
Royal Fern	*Osmunda regalis*

Common Name	*Botanical Name*
Broad Beech Fern	*Phegopteris hexagonoptera*
Polypody	*Polypodium vulgare*
Rusty Woodsia	*Woodsia ilvensis*
Obtuse Woodsia	*Woodsia obtusa*
Chain Fern	*Woodwardia virginica*
Narrow Chain Fern	*Woodwardia areolata*
Shining Club Moss	*Lycopodium lucidulum*
Common Club Moss	*Lycopodium clavatum*
Ground Cedar	*Lycopodium dendroideum*
Ground Pine	*Lycopodium complanatum*, var.

CHAPTER XIII

Bird Sanctuaries

Plant life and bird life are so closely related that they are not only dependent upon each other but require an environment friendly to both for their mutual protection, prosperity and continued existence. It is a well established fact that the destruction of woodlands, thickets and other coverts in densely settled sections, is one of the principal causes of the growing scarcity of many of our most beautiful and useful birds—migratory species especially,—who on finding their accustomed nesting and feeding places abolished, proceed without stopping to seek new quarters in remote regions.

How to prevent this annual "pass-over" is a problem which confronts both the farmer who needs bird-coöperation in destroying injurious insects and the bird lover whose interest is of a more sentimental character, but none the less important on that account.

The only practical solution of the problem seems to be the setting apart by land owners

WHAT EVERY BIRD LOVES

WOODLAND PATH TO THE ROCK GARDEN

(*See page 352*)

of appropriate areas where by judicious planting and grouping of trees, evergreens, shrubs, vines and wild flowers, refuges or sanctuaries can be established that will attract the birds, and as far as possible meet their living requirements.

Such sanctuaries, when properly equipped, provide sheltered and secluded homes with well stocked larders where the birds can build their nests and rear their young in comparative safety. They also serve an important economic purpose because the fostering of bird life means a material lessening of damage to nearby crops by destructive insects. They have an esthetic value because of the opportunity afforded to create charming landscape pictures by the artistic and harmonious arrangement of the ornamental plants that are indispensable in their construction. And finally they have a recreational character in that they provide a never failing source of enjoyment for every member of the family; for there is no outdoor pastime that is of more absorbing interest, gives greater pleasure or is more conducive to physical health and mental vigor than the study of bird life in the open.

The great national and state preserves established for the conservation of bird life have accomplished wonders; and a notable

increase in number, particularly of game birds and certain songsters that were formerly ruthlessly slaughtered for food, has resulted from the security and seclusion that these refuges assure. But the work will not reach the desired degree of success until it is supplemented by the establishment of private sanctuaries on country estates and even on home grounds of smaller proportions, if suitable locations and conditions are available.

The ideal bird sanctuary is an open glade near the edge of virgin woods, which merge into a bordering coppice or thicket having a dense undergrowth of evergreens, berry bushes, vines and creepers. A very desirable adjunct is a nearby brook or pond with a similar tangle on the forest side and considerable moist land adjacent. A covert of this description and extent, which can be provided on many country places, offers the greatest possible inducement to the largest number of bird species.

The United States Department of Agriculture, in an effort to remedy the calamitous destruction of crops by worms and bugs following the disappearance of birds, has made a very practical sanctuary suggestion—one which has a decidedly esthetic side and is therefore pertinent here. It is in brief, that trees and shrubs, particularly those

which bear edible fruits, be planted along the lines dividing cultivated fields, for the purpose of attracting the birds.

Before the advent of the modern post and wire fence fields were divided, as a rule, by zigzag rail or "snake" fences. In the angles of these picturesque barriers grew dense clumps of thorns, elders and other berry-bearing bushes and vines, which provided shelter and nesting sites for vast numbers of birds. The change in fence construction, while it brought a larger area under the plow, has not resulted in a corresponding increase in yield; for by abolishing the bushes it has driven away the birds, leaving the bugs to multiply and do their destructive work on an ever greater scale, without molestation. The suggestion of the department should therefore be widely adopted; and whoever in so doing makes the old time rail fence the backbone of the new planting, will increase its effectiveness as a lure for the birds and at the same time add greatly to the beauty of the landscape.

An excellent site for a bird sanctuary which will appeal to those who like to hear and see the birds and have them within convenient reach, is among the shrubbery bordering the lawn. There is frequent opportunity here to form an enclosure with encircling trees and

shrubs of suitable species, in which a bird bath can be a permanent and essential feature and where a comfortable seat can be installed in some secluded recess, from which the birds can be studied and enjoyed at close hand. If care is taken not to molest or frighten them, even the wildest birds soon become reconciled to the presence of human visitors and go about their accustomed activities undisturbed and unafraid.

Even one elderberry bush or a single dogwood tree can constitute a bird sanctuary and, if near a window, may afford greater pleasure to the observer inside than a woodland preserve covering acres would to its owner if he took no interest in birds. I have a handsome dogwood tree just off my sun porch which is visited by birds every day in the year. There are between thirty and forty different species that are certain to alight among its branches and foliage during the spring and summer; and in autumn, when its scarlet berries are ripe, the number and variety are largely increased. Even in winter, the woodpeckers, nuthatches and chickadees are there several times a day; and the song sparrows, juncos, brown creepers and other interesting kinds are frequent guests. The dogwood itself seems to meet all living requirements during the growing and fruiting

season and my Boy Scout maintains a winter feeding station which never lacks suet or crumbs.

So, if you can do no better, plant an elderberry or a dogwood, equip it with a covered feeding station, and be assured of an unsuspected number of feathered visitors all the year round.

One of John Burroughs' sayings was, in effect: "That a bird in the bush is worth much more than a bird in the hand; because in the bush it is a living fact and not a mere specimen." In your sanctuary you have the bird in the bush and may learn at first hand its personal habits, its "tricks and its manners," its color, size and methods of flight, its food preferences, its way of constructing nests, its home life, its songs and its migratory periods. You also come to know and love the birds as animate, sentient beings, you thrill with their melody, you admire their grace and their beautiful plumage, you come to realize their importance in the landscape, you accept them as factors in your daily life and thereby the field of your interests is broadened and you acquire both intellectual satisfaction and esthetic enjoyment.

In the construction of a bird sanctuary, whether of small or large extent, every possible means should be employed to protect

the birds from their enemies. Of these, the worst offenders are cats, hawks, hunters and nest-robbers. Belling a cat will prevent it from capturing old birds, but will not keep it from pouncing upon and devouring fledglings. A conveniently located tangle of cat-briers and blackberry brambles will prove much more effective, by providing a refuge into which cats and other predatory animals cannot easily penetrate. The shelter of low-branched hemlocks and spruces is a safe hiding place from hawks and other keen-eyed birds of prey. Human enemies can be driven away by the same precautions that are adopted for the protection of the premises generally.

It is also essential to provide as much protection as possible from the elements. In exposed situations, for example, there should be a sheltering windbreak of tall, dense evergreens to prevent the blowing away of nests and the destruction of young birds by violent storms. Many of our most attractive birds build their nests in hollow trees. When "cleaning out" woodlands or "treating" forest trees, as many hollows as possible in both branches and main trunks should be left undisturbed. Where these natural shelters and nesting places are not present, artificially hollowed nesting limbs can be

CANADA ANEMONE (*A. canadensis*)
Photo by E. T. Wherry

RUE ANEMONE (*Anemonella thalictroides*)

EARLY SAXIFRAGE (*Saxifraga virginiensis*)
Photo by C. R. Shoemaker

BISHOP'S CAP (*Mitella diphylla*)
Photo by C. R. Shoemaker

provided. These should be at least two feet long by six inches in diameter to suit the woodpeckers, and should be cut diagonally at both ends, so they can be nailed to the tree, or to the side of a large branch. Other effective shelters from rain, ice and snow, are bird boxes of various sizes.

The following list of the different nesting sites preferred by many of the most desirable birds will be found helpful in devising suitable shelters.

Underground nests—the Kingfisher and the Bank Swallow. Nests on the surface of the ground—Bobolink, Meadow Lark, Junco, Vesper Sparrow, Song Sparrow, Towhee, Oven Bird, Hermit Thrush, Wilson Thrush.

In tussocks of swamp grass or tangles of ferns—Red-winged Blackbird, Maryland Yellowthroat, Song Sparrow, Sharp-tailed Sparrow, Blue-winged Warbler, Golden-winged Warbler.

In bushes and low saplings of thickets from one to eight feet above the ground—Cuckoo, Alder Flycatcher, Goldfinch, Cardinal Bird, Indigo Bird, Shrike, White-eyed Vireo, many warblers, Catbird, Redstart, Brown Thrasher, Olive Backed Thrush.

In the lower branches of large trees—Mourning Dove, Ruby-throated Humming-

bird, Kingbird, Pewee, Blue Jay, Orchard Oriole, Purple Finch, Goldfinch, Rose-breasted Grosbeak, Scarlet Tanager, Cedar Waxwing, Red-eyed Vireo, Golden-crowned Kinglet, Wood Thrush, Robin, several Warblers and Flycatchers.

In tree tops—Owls, Crows, Grackles, Baltimore Oriole, Olive-sided Flycatcher, Siskin, Yellow-throated Vireo, Cerulean Warbler, Blackburnian Warbler, Pine Warbler.

In hollow or excavated trees—Hawks, Owls, Crested Flycatcher, Tree Swallow, Carolina Wren, House Wren, Brown Creeper, Nuthatch, Tufted Titmouse, Chickadee, Starling and all the woodpeckers.

In bird boxes—Screech Owl, Crested Flycatcher, Purple Martin, Tree Swallow, Carolina Wren, House Wren, Chickadee, Robin, Bluebird, Starling. In addition, all birds which naturally nest in hollow trees.

The trees, shrubs, vines and wild flowers which are most attractive to the birds because of their fruits, or their suitability as nesting sites, include many of our most attractive species, and their arrangement in and about the bird sanctuaries affords pleasurable opportunity for the expression of personal taste. The following list is fairly comprehensive:

List of Berry Bearing Shrubs to Attract Birds

Red Cedar (*Juniperus virginiana*)
Flowering Dogwood (*Cornus florida*)
Gray Dogwood (*Cornus paniculata*)
Red-osier Dogwood (*Cornus stolonifera*)
Alternate-leaved Dogwood (*Cornus alternifolia*)
Dockmackie (*Viburnum acerifolium*)
Hobble Bush (*Viburnum alnifolium*)
Nannyberry (*Viburnum lentago*)
Highbush Cranberry (*Viburnum opulus*)
Spice Bush (*Benzoin æstivale*)
Highbush Blueberry (*Vaccinium corymbosum,*
Low Sweet Blueberry (*Vaccinium pennsylvanicum*)
Late Blueberry (*Vaccinium vacillans*)
Black Huckleberry (*Gaylussacia baccata*)
Pepperidge Tree (*Nyssa sylvatica*)
Bird Cherry (*Prunus pennsylvanica*)
Choke Cherry (*Prunus virginiana*)
Shadbush (*Amelanchier canadensis*)
Winterberry (*Ilex verticillata*)
Bayberry (*Myrica carolinensis*)
Hackberry (*Celtis occidentalis*)
Red Mulberry (*Morus rubra*)
Sassafras (*Sassafras variifolium*)
Thorns (*Cratægus*, in variety)
Fox Grape (*Vitis labrusca*)
River Grape (*Vitis vulpina*)
Virginia Creeper (*Psedera quinquefolia*)
Common Elder (*Sambucus canadensis*)
Red-berried Elder (*Sambucus racemosa*)

Pasture Rose (*Rosa humilis*)
Smooth Sumac (*Rhus glabra*)
Staghorn Sumac (*Rhus typhina*)
Mountain Ash (*Pyrus americana*)
Wild Sarsaparilla (*Aralia nudicaulis*)
Wintergreen (*Gaultheria procumbens*)
Partridgeberry (*Mitchella repens*)
Bunchberry (*Cornus canadensis*)
Fly Honeysuckle (*Lonicera canadensis*)

CHAPTER XIV

Rock Gardens and Other Wild Plantings

One of the prevalent garden heresies teaches that rock gardens are essentially artificial affairs, made solely for the purpose of growing plants from every country on the face of the globe except America. I have yet to read a book or a magazine article on rock gardening that even suggests natural rock outcrops as fit locations, or that recommends more than a very few species of native ferns and flowering plants as appropriate material. Yet, some of the most exquisitely beautiful rock gardens I have ever seen are either purely and entirely natural, or owe but a small part of their charm to human effort.

Nature seems to delight in showing what she can do unaided with a rock or two and a few wild plants, particularly in fields and pastures where picturesque, weather-worn boulders abound. Almost invariably she utilizes these boulders for miniature rock gardens of her own contriving. Her treat-

ment is simplicity itself, yet always the resulting picture is faultless in composition, rich in color contrast and a feast for the observant eye.

I have in mind a rocky, upland pasture, in the southern Catskill country, where no house is in sight, nor any sign of cultivation; where, to quote Thoreau, "the great, gray boulders, lying here and there, take the place of cottages in the landscape." In this pasture Nature has indulged herself in a riot of rock gardening and has furnished object lessons for her pupils by the score.

One enormous monolith, in a rather dry and sunny spot, is overshadowed by a grotesque thorn tree, lavish of starry bloom and scarlet fruit. Hiding the base of the rock is an irregular mass of dicksonia—the hay-scented fern. Mingled wreaths of virginia creeper and virgin's bower festoon and soften its rugged contours and in numerous crevices the neat little ebony spleenwort finds a foothold. The mossy turf which serves as a foreground, is spangled with blue-eyed grass and quaker ladies. In autumn the purple and gold of asters and golden-rod enliven the fading dicksonia: and even during winter, the weird outline of the thorn, the many-hued lichens on the gray rock surface and the fruits on tree and vines that

GEMS OF THE BONESET FAMILY
Mikania scandens, *Eupatorium ageratoides*, and *E. cœlestinum*

Sneezeweed or Helen Flower
Helenium autumnale

have escaped the birds, must still present a picture of notable charm.

Behind another boulder, down in a marshy corner of the pasture by the brook, a gorgeous winterberry bush takes the place of the thorn; in front the marsh fern and the crested fern supplant the dicksonia. The climbing boneset, with masses of flesh-pink, feathery bloom, serves as drapery; among the ferns the cardinal flower sends up its blazing torch; and the greensward is crowded with white and blue violets, yellow trout lilies and dainty pink spring beauties.

In other situations, with differing conditions of soil and moisture, are other boulders and other simple but lovely plant combinations, in such amazing variety that it seems as if any keen-eyed enthusiast could find here a living pattern for every conceivable kind of rock or wild garden.

An admirable example of what anyone can accomplish by judicious and tasteful treatment of a rock formation may be seen at Roll-away Hill, the country place of Mr. Wait Talcott, near North Egremont, Mass. The location of this model rock garden is ideal. Along its eastern boundary winds a limpid trout stream. A moist, grassy and sunny slope rises gradually from the brook to the edge of a dense thicket some fifty feet

away. Along the stream and scattered through the little meadow are dozens of mossy, half-buried boulders of many sizes and contours. Conspicuous among the trees and bushes in the thicket, are dogwoods, shadbushes, white birches, hemlocks and both the purple and red-berried elders. Beyond them and extending for a hundred feet or more, to the base of a broken cliff, is a bit of primitive forest, with lofty straight-boled trees and a rocky floor where shade loving ferns and wild flowers flourish. In some places the face of the cliff is almost perpendicular; in others it resembles huge steps. Near the center it recedes in a half-circle, forming a sort of amphitheater with sloping sides, down which trickle innumerable tiny rivulets which lose themselves among the loose stones and débris at the bottom.

Entering at the northern end of the garden area is a beaten footpath leading south along the brook, with a branch, starting near the entrance, that goes through a gap in the thicket and winds upward among the rocks. As it nears the cliff, natural looking steps have been provided from which the path leads to and across the lower part of the amphitheater and thence in zig-zag fashion down the hill again and out into the meadow.

Within the forest the shade is intensely

deep, even on the brightest days. The soil is rich, moist humus, except along the top of the cliff and in its crevices where no water drips. In these places it is dry and rather sandy. All the soils in the woods and on the cliff are strongly acid, while those in the meadow and along the brook are only mildly so.

No preliminary treatment was given the locality except the removal of a number of dead, dying and superfluous trees, and the grubbing out by the roots of all brambles, weedy growths and other undesirable vegetation. This involved a loosening of the surface soil which put it in fine shape for planting operations. Nothing whatever was done in the nature of artificial construction, aside from making the paths comfortable for walking, laying a few stepping stones in moist spots, and putting in occasional steps of native rock where needed.

While the natural flora was abundant and in unusual variety, many species were added with the idea of making a practically complete collection of the notably attractive ferns and wild flowers of eastern America. All the plants, both native and introduced, are growing vigorously and increasing in numbers from year to year, so it can be readily imagined how exceedingly beautiful this favored

spot must be, and what a constant source of interest and pleasure it is to its owner, and to his many guests and visitors.

There are a great many private places where the cultural conditions which prevail in this Berkshire rock garden, either now exist or can be approximately duplicated. I have prepared therefore, the following lists of the plants that are flourishing there, in the hope that they will prove helpful to those of my readers who are seeking information and suggestions regarding this fascinating form of wild gardening.

PLANTS FOUND GROWING ON THE AREA

(a) *On Top of Cliff—Soil rather Dry and Sandy.*

Common Name	*Botanical Name*
Pink Azalea	*Rhododendron nudiflorum*
Late Blueberry	*Vaccinium vacillans*
False Indigo	*Baptisia tinctoria*
Maple-leaved Viburnum	*Viburnum acerifolium*
Hemlock	*Tsuga canadensis*
Common Polypody	*Polypodium vulgare*
Evergreen Wood Fern	*Aspidium marginale*
Ebony Spleenwort	*Asplenium platyneuron*
Hay-scented Fern	*Dicksonia punctilobula*
Columbine	*Aquilegia canadensis*
Heart-leaved Aster	*Aster cordifolius*
Wavy-leaved Aster	*Aster undulatus*
Prince's Pine	*Chimaphila umbellata*
Wood Lily	*Lilium philadelphicum*
Partridgeberry	*Mitchella repens*

Common Name	*Botanical Name*
Wintergreen Berry	*Gaultheria procumbens*
Pale Corydalis	*Corydalis sempervirens*
Wood Betony	*Pedicularis canadensis* and *P. lanceolata*
Early Saxifrage	*Saxifraga virginiensis*
Pink Lady's Slipper	*Cypripedium acaule*
Common Speedwell	*Veronica officinalis*

(b) *In Dry Crevices and Pockets of Cliff.*

Evergreen Wood Fern	*Aspidium marginale*
Ebony Spleenwort	*Asplenium platyneuron*
Common Polypody	*Polypodium vulgare*
Columbine	*Aquilegia canadensis*
Partridgeberry	*Mitchella repens*
Early Saxifrage	*Saxifraga virginiensis*

(c) *In Moist Crevices and Pockets of Amphitheater.*

Fragile Bladder Fern	*Cystopteris fragilis*
Long Beech Fern	*Phegopteris polypodiodes*
Liverwort	*Hepatica triloba*
Bloodroot	*Sanguinaria canadensis*
False Spikenard	*Smilacina racemosa*
Dutchman's Breeches	*Dicentra cucullaria*

(d) *Among Detritus at Base of Cliff, in Moist Humus.*

Seedling Hemlocks	*Tsuga canadensis*
Maidenhair Fern	*Adiantum pedatum*
Obtuse Woodsia	*Woodsia obtusa*
Fragile Bladder Fern	*Cystopteris fragilis*
Spinulose Wood Fern	*Aspidium spinulosum*, var. *dilatatum*
Lady Fern	*Asplenium filix-fœmina*
Windflower	*Anemone nemorosa*
Columbine	*Aquilegia canadensis*
Jack-in-the-Pulpit	*Arisæma triphyllum*

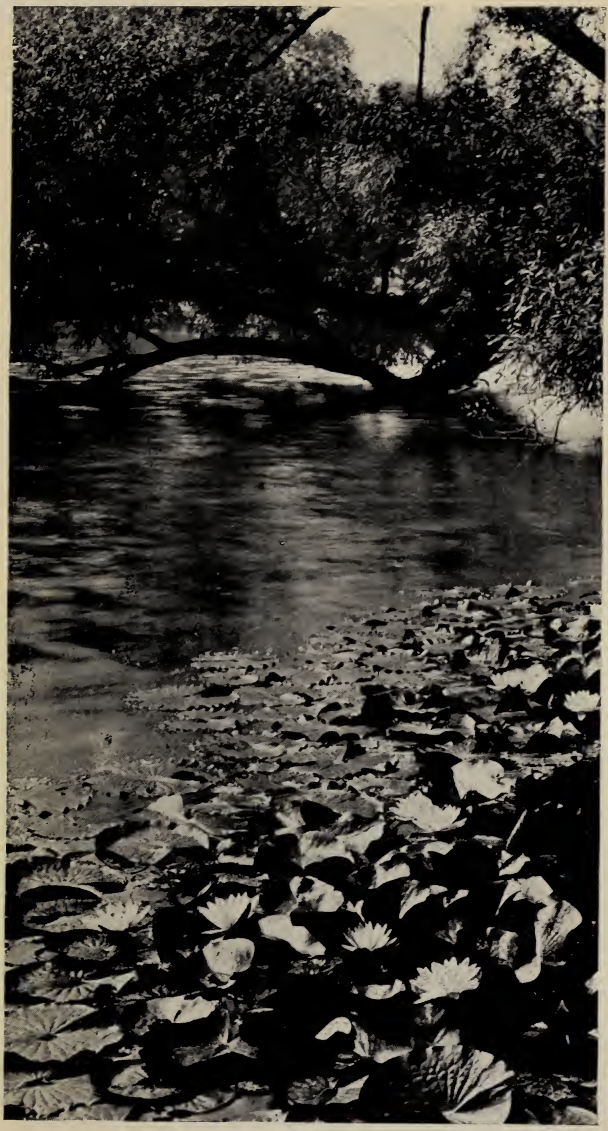
Common Name	*Botanical Name*
Dogtooth Violet (Trout Lily)	*Erythronium americanum*
Liverwort	*Hepatica triloba*
Solomon's Seal	*Polygonatum biflorum*
Bloodroot	*Sanguinaria canadensis*
False Spikenard	*Smilacina racemosa*

(e) *On Rocky Forest Floor, in Damp Humus.*

Seedling Hemlocks	*Tsuga canadensis*
Maidenhair Fern	*Adiantum pedatum*
Christmas Fern	*Polystichum acrostichoides*
Spinulose Wood Fern	*Aspidium spinulosum*, var. *dilatatum*
Trailing Arbutus	*Epigæa repens*
Lady Fern	*Asplenium filix-fœmina*
White Baneberry	*Actæa alba*
Rue Anemone	*Anemonella thalictroides*
Windflower	*Anemone nemorosa*
Jack-in-the-Pulpit	*Arisæma triphyllum*
Spring Beauty	*Claytonia virginica*
Dogtooth Violet (Trout Lily)	*Erythronium americanum*
White Snakeroot	*Eupatorium urticæfolium*
Wild Geranium	*Geranium maculatum*
Liverwort	*Hepatica triloba*
Fringed Milkwort	*Polygala paucifolia*
Partridgeberry	*Mitchella repens*
Solomon's Seal	*Polygonatum biflorum*
Bloodroot	*Sanguinaria canadensis*
Toothwort	*Dentaria diphylla*
Early Rue	*Thalictrum dioicum*
Downy Yellow Violet	*Viola pubescens*
Rattlesnake Plantain	*Epipactis pubescens*

(f) *In and on the Edges of Boundary Thicket—Soil Dry.*

Hay-scented Fern	*Dicksonia punctilobula*
Lady Fern	*Asplenium filix-fœmina*
Bracken	*Pteris aquilina*



WATER LILIES (*Castalia odorata*) IN THE BEND

A NATURAL WATER GARDEN

"In spite of its whiteness and fragrance the water lily requires no help from night-flying insects in having its pollen transferred; therefore, when the bees and flies rest from their labors at sundown it closes the blinds of its shop."—BLANCHAN.

Common Name	*Botanical Name*
White Snakeroot	*Eupatorium urticæfolium*
Star Grass	*Hypoxis hirsuta*
New York Aster	*Aster novi-belgii*
Canada Mayflower	*Maianthemum canadense*
Spring Beauty	*Claytonia virginica*
Dogtooth Violet (Trout Lily)	*Erythronium americanum*
Wild Geranium	*Geranium maculatum*
Meadow Lily	*Lilium canadense*
Golden-rod	*Solidago* in variety
Ten-petaled Sunflower	*Helianthus decapetalus*
Common Blue Violet	*Viola papilionacea*
Downy Yellow Violet	*Viola pubescens*

(g) *In Meadow Grass—Soil Moist and Rich.*

Blue-eyed Grass	*Sisyrinchium angustifolium*
Quaker Ladies	*Houstonia cærulea*
Dog Violet	*Viola conspersa*
Sweet White Violet	*Viola blanda*
Great Blue Lobelia	*Lobelia syphilitica*
Wild Strawberry	*Fragaria virginiana*

(h) *On Banks and Margin of Brook—Soil Moist to Wet*

Cinnamon Fern	*Osmunda cinnamomea*
Interrupted Fern	*Osmunda claytoniana*
Crested Fern	*Aspidium cristatum*
Marsh Fern	*Aspidium thelypteris*
Sensitive Fern	*Onoclea sensibilis*
New England Aster	*Aster novæ-angliæ*
Turtlehead	*Chelone glabra*
Closed Gentian	*Gentiana andrewsii*
Cardinal Flower	*Lobelia cardinalis*
Marsh Marigold	*Caltha palustris*
Meadow Rue	*Thalictrum polygamum*
Arrowhead	*Sagittaria latifolia*
Joe-Pye-Weed	*Eupatorium purpureum*
Wild Mint	*Mentha arvensis* var.
Bur Marigold	*Bidens lævis*

PLANTS ADDED TO INCREASE NUMBER OF SPECIES

(a) *On Top of Cliff and in Dry Crevices.*

Common Name	*Botanical Name*
Rusty Woodsia	*Woodsia ilvensis*
Bluebells	*Campanula rotundifolia*
Wood Lily	*Lilium philadelphicum*
Dwarf Iris	*Iris verna*
Wild Pink	*Silene pennsylvanica*
Mountain Sandwort	*Arenaria groenlandica*
Stonecrop	*Sedum acre*
Violet Wood Sorrel	*Oxalis violacea*
Bird-foot Violet	*Viola pedata* and variety *bicolor*
Downy Yellow Violet	*Viola pubescens*
Spotted Wintergreen	*Chimaphila maculata*
Bearberry	*Arctostaphylos uva-ursi*
Lovely Phlox	*Phlox amœna*
Smooth Aster	*Aster lævis*

(b) *In Moist Crevices and Pockets.*

Maidenhair Spleenwort	*Asplenium trichomanes*
Walking Leaf Fern	*Camptosorus rhizophyllus*
Bulbiferous Bladder Fern	*Cystopteris bulbifera*
Clintonia	*Clintonia borealis*
Large-flowered Bellwort	*Uvularia grandiflora*
Yellow Lady's Slipper	*Cypripedium parviflorum*
Sharp-lobed Liverwort	*Hepatica acutiloba*
Twin-leaf	*Jeffersonia diphylla*
Bishop's Cap	*Mitella diphylla*
Herb Robert	*Geranium Robertianum*

(c) *Among Detritus at Base of Cliff.*

Maidenhair Fern	*Adiantum pedatum*
Braun's Holly Fern	*Polystichum braunii*
Male Fern	*Aspidium filix-mas*

Common Name	*Botanical Name*
Oak Fern	*Phegopteris dryopteris*
Wake Robin	*Trillium erectum*
Large Flowering Trillium	*Trillium grandiflorum*
Southern Pink Trillium	*Trillium stylosum*
Crested Iris	*Iris cristata*
Showy Orchis	*Orchis spectabilis*
Showy Lady's Slipper	*Cypripedium hirsutum*
Canada Violet	*Viola canadensis*
Shooting Star	*Dodecatheon meadia*
Wild Blue Phlox	*Phlox divaricata*

(d) *On Rocky Forest Floor.*

Goldie's Fern	*Aspidium goldianum*
Spinulose Wood Fern	*Aspidium spinulosum,* var. *dilatatum*
Narrow-leaved Spleenwort	*Asplenium angustifolium*
Climbing Fern	*Lygodium palmatum* (over low shrubs)
Broad Beech Fern	*Phegopteris hexagonoptera*
Red Baneberry	*Actæa rubra*
Foam Flower	*Tiarella cordifolia*
Creeping Dalibarda	*Dalibarda repens*
Wood Sorrel	*Oxalis acetosella*
Ginseng	*Panax quinquefolia*
Bunchberry	*Cornus canadensis*
Greek Valerian	*Polemonium reptans*
Culver's Root	*Veronica virginica*
Blue Mist Flower	*Eupatorium cælestinum*

(e) *In and on Edge of Thicket.*

Virginia Cowslip	*Mertensia virginica*
May Apple	*Podophyllum peltatum*
Toothwort	*Dentaria diphylla*
Golden Ragwort	*Senecio aureus*

(f) *On Banks and Margin of Brook.*

Common Name	*Botanical Name*
Royal Fern	*Osmunda regalis*
Turk's Cap Lily	*Lilium superbum*
Ostrich Fern	*Onoclea struthiopteris*
Grass-of-Parnassus	*Parnassia caroliniana*
Larger Blue Flag	*Iris versicolor*
Swamp Rose-mallow	*Hibiscus moscheutos*
Meadow-beauty	*Rhexia virginica*
Forget-me-not	*Myosotis scorpioides*
Bee Balm	*Monarda didyma*
Monkey Flower	*Mimilus ringens*
Sneezeweed	*Helenium autumnale*

WILD BOG AND WATER GARDENS

A wise rule to follow is to let swampy ground and natural pools remain undisturbed if possible. While the grubbing out of weedy plants and other obnoxious growth is usually necessary, my experience has been that much digging and turning over of marshy or peaty soil is disastrous. It simply makes mud which the sun soon bakes into brick, and in which no vegetation will thrive until a year or more has gone by.

There is a marked distinction between a bog and a marsh, or swamp. In a bog, properly speaking, there is no drainage and the soil is a mixture of decaying leaves, twigs and other vegetable matter that is known as muck. The soil in a marsh is usually fairly well drained, is much lighter in texture, and is

HOW NATURE MAKES A BOG GARDEN

And nearer to the river's trembling edge
There grew broad flag flowers, purple prankt with white,
And starry river buds among the sedge
And floating water lilies, broad and bright,
Which lit the oak that overhung the hedge
With moonlit beams of their own light.

—Shelley.

apt to show an acid reaction of considerable intensity. A marsh frequently borders and drains into a bog, and it is sometimes difficult to tell where one leaves off and the other begins. In other cases it is near and drains into some stream, pool or larger body of water.

The bog, the swamp and the water each have a distinctive flora, including many choice and interesting kinds that will not grow elsewhere, but there are many plant species that thrive equally well in either of the first two, and a few that take kindly to all three. The following lists are arranged accordingly, and from them selections can be made that will transform any wet place into a garden of delight.

1. *Aquatic Plants Exclusively.*

Common Name	*Botanical Name*
Water Plantain	*Alisma plantago-aquatica*
Arrowhead	*Sagittaria latifolia*
Golden Club	*Orontium aquaticum*
Pickerel Weed	*Pontederia cordata*
Water Shield	*Brasenia peltata*
Floating Heart	*Limnanthemum lacunosum*
Mud Plantain	*Heteranthera reniformis*
Water Lily	*Castalia odorata*
Yellow Pond Lily	*Nymphæa advena*

2. *Plants Growing in Bogs, or Still Water.*

Narrow-leaved Cat-tail	*Typha angustifolia*
Water Arum, or Wild Calla	*Calla palustris*

Common Name	*Botanical Name*
Buck Bean	*Menyanthes trifoliata*
Stud Flower	*Helonias bullata*
Marsh Marigold	*Caltha palustris*
Pitcher Plant	*Sarracenia purpurea*

3. *Plants found both on Bog Hummocks and in Swamps.*

Cinnamon Fern	*Osmunda cinnamomea*
Royal Fern	*Osmunda regalis*
Crested Fern	*Aspidium cristatum*
Marsh Fern	*Aspidium thelypteris*
Sensitive Fern	*Onoclea sensibilis*
The Chain Ferns	*Woodwardia virginica*, and *W. areolata*
White Swamp Honeysuckle	*Rhododendron viscosum*
Rhodora	*Rhododendron canadense*
Purple Cinquefoil	*Potentilla palustris*
Marsh St. Johnswort	*Hypericum virginicum*
Grass Pink	*Calopogon pulchellus*
Purple Fringed Orchis	*Habenaria psycodes*
Snake Mouth	*Pogonia ophioglossoides*
The Sundews	*Drosera* species
Swamp Rose-mallow	*Hibiscus moscheutos*

4. *Plants preferring Marshes with Drainage.*

Silvery Spleenwort	*Asplenium acrostichoides*
Ostrich Fern	*Onoclea struthiopteris*
Interrupted Fern	*Osmunda claytoniana*
Blazing Star	*Chamælirium luteum*
Dogtooth Violet (Trout Lily)	*Erythronium americanum*
Larger Blue Flag	*Iris versicolor*
Slender Blue Flag	*Iris prismatica*
Purple Fringed Orchis	*Habenaria psycodes* and *H. fimbriata*
Showy Lady's Slipper	*Cypripedium hirsutum*
Tall Meadow Rue	*Thalictrum polygamum*
Swamp Buttercup	*Ranunculus septentrionalis*
Purple Avens	*Geum rivale*

Common Name	*Botanical Name*
Jewel Weed	*Impatiens* species
Sweet White Violet	*Viola blanda*
Meadow-beauty	*Rhexia virginica*
Bottle Gentian	*Gentiana andrewsii*
Swamp Milkweed	*Asclepias incarnata*
False Dragonhead	*Physostegia virginiana*
Turtle-head	*Chelone glabra*
Monkey-flower	*Mimilus ringens*
Cardinal Flower	*Lobelia cardinalis*
Great Lobelia	*Lobelia syphilitica*
Ironweed	*Vernonia noveboracensis*
Joe-Pye-Weed	*Eupatorium purpureum*
Golden-rod	*Solidago*, several species
Aster	Several species
Tall Sunflower	*Helianthus giganteum*
Bur Marigold	*Bidens lævis*
Sneezeweed	*Helenium autumnale*, and varieties
Golden Ragwort	*Senecio aureus*
Swamp Thistle	*Cirsium muticum*

5. *Wild Bushes for Swamp Planting.*

Spice Bush	*Benzoin æstivale*
Shadbush	*Amelanchier canadensis*
Sweet Pepperbush	*Clethra alnifolia*
Great Rose Bay	*Rhododendron maximum*
Sheep-laurel	*Kalmia angustifolia*
Highbush Blueberry	*Vaccinium corymbosum*
Winterberry	*Ilex verticillata*
Sweet Gale	*Myrica gale*
Red Chokeberry	*Pyrus arbutifolius*
Pussy Willow	*Salix discolor*
Swamp Rose	*Rosa carolina*
Shrubby Cinquefoil	*Potentilla fruticosa*
Meadowsweet	*Spiræa latifolia*
Steeplebush	*Spiræa tomentosa*
Hobble Bush	*Viburnum alnifolium*

With these bushes, may be combined with fine effect, young specimens of the hemlock, *Tsuga canadensis*, the arborvitæ, *Thuya occidentalis* and the red cedar, *Juniperus virginiana*.

All wild and uncultivated areas can be greatly improved in appearance by naturalistic gardening of some kind. To learn what plants are best for any locality or purpose, it is only necessary to note the natural growth in similar situations and duplicate it as closely as circumstances will permit. Nature shows no partiality. Wherever there is bare ground, she plants a garden. She cares not whether the soil is rich or poor, moist or dry, in dense shade or full sun, sheltered or fully exposed to wind and storm. Everywhere she grows plants—beautiful plants—that flourish and increase and become pleasing features of the landscape.

I cannot imagine a more delightful and absorbing pastime than studying Nature's ways with plants and using the knowledge thus acquired, to create gardens—new kinds of gardens, that will follow her teachings, reflect something of her charm and literally make glad the waste places.

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PART II

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